THE RAILWAYS OF BURMA – THEIR PAST, PRESENT AND FUTURE

The Railways of Burma – Their Past, Present and Future

by

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Dedicated to the memory of my parents,
Howard Richard Thomas Clyde Stubbs (1915-2003)
and Catherine Elizabeth Stubbs (1919-2008).

Preface

This thesis had its origins in my first trip to Burma in January 1975. General Ne Win had been in power for thirteen years, and there was a great deal of tension in the capital Rangoon following civil unrest and riots after the death of U Thant, the former Secretary-General of the United Nations. The visit was for just seven days, as that was the maximum tourist visa allowed. I travelled by train, *The Mandalay Express*, north to Mandalay and then by ferry down the Irrawaddy to Pagan, before flying back to Rangoon, a city still under a 9 p.m. to 4 a.m. curfew.[1] Much has changed in Burma since that visit in the mid 1970's, but much is still the same. The ferry down the Irrawaddy today is remarkably similar to the one I travelled on forty years ago. The train to Mandalay is much the same, with young girls selling water from clay urns on their heads at the stations. In 1975 the railways were clearly a major component of the country's infrastructure. Forty-three years on the railways are still an important part of Burmese infrastructure, but there has been little improvement in the railways between then and now.[2]

[1] Taylor, Robert H., (2015), "General Ne Win. A Political Biography", Institute of Southeast Asian Studies, Singapore, p.435.

My memory of the curfew is walking through darkened streets early in the morning from the YMCA in Rangoon to the main railway station. It was not safe to leave the YMCA until about 6 a.m.

[2] The photograph shows the logo of Myanma Railways, with an image of the locomotive used when the Rangoon to Prome line was opened in 1877. This photograph was taken at Kalaw Railway Station in December 2008. As the logo shows, at the time the name was "Myanmar Railways" rather than "Myanma Railways".

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All of the photographs have been taken by the author on field trips to Burma, except for the following ten photographs:

- Five black-and-white ones, including Plates 38 and 39 of the Gokteik Viaduct and Plates 58 and 59 which appeared in *The New Light of Myanmar* in 2011.
- Plate 11, a photograph of a Bo-Bo-Bo locomotive, which was sourced from the *Railway Gazette*.
- Plate 170, which shows a share certificate issued by the Arakan Light Railway Co. Ltd. in 1917.
- Plate 171, which shows a Beyer Garratt locomotive constructed for the Arakan Light Railway.
- Plates 163 and 169, which appeared in *The Global New Light of Myanmar* in 2014 and 2016 respectively.

Abstract

The key theme of this thesis is how the railways of Burma have performed in the past and what their prospects are for the future. Case studies of two rural lines (the Aungban-Loikaw line and the Kyangin-Pakokku line) and a study of the railways in southern Shan State suggest that there were poor construction methods in the past, and that today there is a lack of maintenance and a lack of commitment from Myanma Railways to fund these lines. The thesis begins with an examination of the economic benefits and impact of railways, including a discussion of railway finance with a focus on the Operating Ratio. Chapter 3 is the core of this thesis with a statistical overview of the railways in Burma, with an emphasis on the period since World War II. Information is drawn from multiple sources to construct time series graphs of key aspects relating to the railways in Burma. Chapter 4 considers the likelihood of the construction of a China-Burma Railway from Yunnan Province in China, to Kyaukphyu on the coast of Rakhine State, Burma. The recently opened railway from Nairobi to Mombasa in Kenya could be a model for a future China-Burma Railway, but major economic and political concessions would need to be made by the government of Burma for such a line to be built. Chapter 5 is the case study of the line to Loikaw, and Chapter 6 of the line on the west bank of the Irrawaddy River from Kyangin to Pakokku. The study of the Kyangin-Pakokku line highlights the poor quality of construction undertaken by Myanma Railways in recent years; the poor quality of current maintenance on the line; and the poor facilities for passengers on the line. Chapter 7 discusses the railways in southern Shan State, concluding that construction of the Shan State Railway is important from an economic viewpoint, but is a long way off. Chapter 8 covers a number of smaller topics, including international links, for example the possibility of a railway from Burma to India. By looking at past statistics relating to the railways, insight is provided into the issues faced by Myanma Railways today. The thesis draws on empirical evidence from field trips to Burma to highlight areas of concern with the current operations of Myanma Railways. This thesis recommends that the government achieve a balance between the funding of key lines such as the Yangon-Mandalay line and the Circular Railway in Yangon compared to the funding of work (e.g. repair, maintenance and construction) on smaller regional lines.

Declaration of Candidate

I certify that the work in this thesis entitled "*The Railways of Burma – Their Past, Present and Future"* has not previously been submitted for a degree nor has it been submitted as part of the requirements for a degree to any other university or institution other than Macquarie University.

I also certify that the thesis is an original piece of research and has been written by myself. Any help and assistance that I have received in my research work and the preparation of the thesis itself have been appropriately acknowledged.

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Student ID: 42382017

Acknowledgments

I wish to express my sincere thanks to my Principal Supervisor, Dr Sean Turnell, without whom this research project would not have happened. I first met Sean at a seminar at the University of Technology, Sydney in 2009. He has been extremely generous and patient with his time and knowledge in this research project, and above all has been extremely enthusiastic as to the value of the work being done. It has been a privilege to work with Sean, and I gratefully acknowledge all he has done and offer him my sincere thanks.

I must also express my thanks to Dr Pundarik Mukhopadhaya, the Associate Supervisor for this research project. Pundarik has also been very kind and generous with his time, and has provided added insight into various aspects of the analysis and the preparation of this thesis. I am particularly grateful to him for his help in organising a field trip to India in January 2014 when I visited Calcutta and the states of Assam, Nagaland and Manipur.

During my field trips to Burma I received assistance, help and advice from several employees of Myanma Railways. It is best that I not mention them by name here, but several locomotive drivers, Station Masters and other railway staff made my trips much easier and rewarding as I travelled throughout Burma on the railways. I am extremely grateful to them all.

I gratefully acknowledge the support and encouragement over several years from Frederic Benson, who has helped me locate some of the sources of the statistical data used in Chapter 3, and has kept me up-to-date with any news related to the two proposed railway projects in Laos.

I am grateful to Andrew Selth for drawing to my attention several books and articles relating to the railways in Burma, particularly during the World War II period. Siegfried Blunk, whom I met while visiting Dawei in December 2011, has drawn my attention to several important articles relevant to this thesis and has been a continual source of encouragement. I am grateful to Latika Chaudhary for helping me find data on the railways in Burma for the early colonial period. I also gratefully acknowledge the help of Win Pe who kindly translated from Burmese into English various railway signs and other signs in some of my photographs.

Writing a lengthy thesis using *Microsoft Word* and *Excel* is not without its challenges. For help on this and other computing-related issues I gratefully acknowledge assistance and advice from Angela Chow, Martin Waterworth,

Bernard Gatimu, Fabrice Goviden, Andy Baho, Arena Hu, Yunping Chen and Deanna Tracy. I am particularly grateful to Arena Hu for her proofreading of the final version of this thesis.

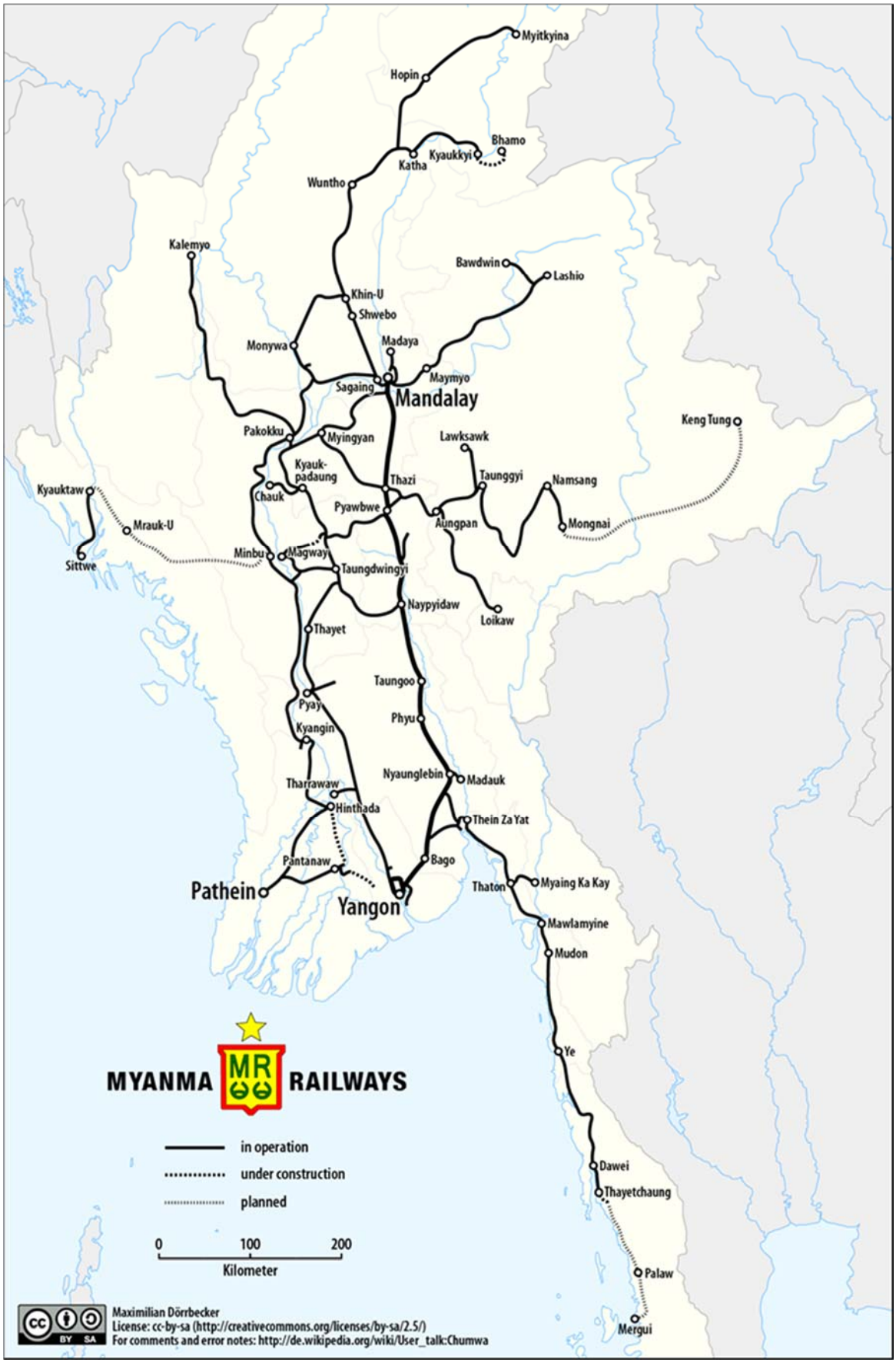
We are lucky at Macquarie University to have an excellent modern library. I wish to acknowledge the staff on Services Desk in the library who were extremely helpful in assisting me to apply for inter-library loans for some obscure articles and books on railways, as well as ones about Burma. In particular, I thank Andrew Miller and Ian McAllan for their help.

Lastly, it would be remiss of me not to acknowledge the late Professor Ray Golding *AO*, former Professor of Physical and Theoretical Chemistry at the University of New South Wales, who had a love of research. It was he who first had the confidence in me to carry out research, and instilled in me the discipline that is hopefully reflected in this thesis today.

Map of Burma

Map 1: Modern-day Burma.

Map of the Myanma Railways Network



Map 2: The Myanma Railways network.

Chapter 1

INTRODUCTION

1.1 Introduction

Burma is a country brimming with possibilities. It is strategically located between the two emerging economic powerhouses of China and India. At the East Asia Summit held in Bali in November 2011 in conjunction with a meeting of ASEAN, the US president, Barack Obama, described Burma as:[1]

> *a country with a rich history, at the crossroads of the East and West; a people with a quiet dignity and extraordinary potential.*

Geographically Burma is at a crossroads, between the East and the West. However, as Thant Myint-U has stressed, Burma is crucially at a crossroads between China and India: geographically, politically and economically.[2] For nearly fifty years, from March 1962 onwards, the country was ruled by a military dictatorship. One consequence of this military rule is that a country which was once described as the "*rice bowl of Asia*" is now one of the poorest countries in Asia.[3]

Burma is frequently in the news for political reasons. It is a country of over 51 million people, with the majority living in poverty.[4] On the political front, until very recently Burma has been ruled by military governments following a coup headed by General Ne Win in 1962.[5] National elections held in November 2010

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[1] *The Irrawaddy*, (2011, November 18), "Obama Statement: Clinton to Go to Burma". Retrieved from: http://www2.irrawaddy.org/article.php?art_id=22487.

[2] Thant Myint-U, (2012). "White Elephants and Black Swans: Thoughts on Burma/Myanmar's Recent History and its Possible Future", in Cheesman, N., Skidmore, M. and T. Wilson (eds.), "Myanmar's Transition: Openings, Obstacles and Opportunities", (2012), Institute of Southeast Asian Studies, Singapore, pp.23-35; and

Thant Myint-U, (2011), "Where China Meets India. Burma and the New Crossroads of Asia", Farrar, Straus and Giroux, New York.

[3] Aung Thet Wine, (2010, January 18), "Burma Could be the 'Rice Bowl of Asia Again': MRIA", The Irrawaddy. Retrieved from: http://www2.irrawaddy.org/article.php?art_id=17603; and

Bangkok Post, (2015, April 9), "Myanmar farmers dream of resurrecting Asia's rice bowl". Retrieved from: http://www.bangkokpost.com/business/world/523587/myanmar-farmers-dream-of-resurrecting-asia-rice-bowl.

[4] *The New Light of Myanmar*, (2014, August 30), "Population of Myanmar totals over 51 million: Preliminary Population Census". Retrieved from: http://www.burmalibrary.org/docs19/NLM2014-08-30-red.pdf.

[5] Taylor, (2015), *op. cit.,* pp.255-308.

were neither free nor fair.[6] Yet less than a week after the elections, Aung San Suu Kyi was released from nearly twenty years of house arrest. In an interview in early 2011, she summed up the political situation as follows:[7]

> *We don't think it's necessarily a step forward towards democracy. I have said time and again a blatant dictatorship is better than a parody of democracy, if there's a parody of democracy - it makes people complacent or gives them an excuse to say 'There's no longer any necessity to work for democracy in Burma.'*

The political landscape is changing rapidly in Burma. After her release, Aung San Suu Kyi was much freer to engage in political dialogue both internally and with those abroad. She was elected to Parliament in by-elections held in Burma in early 2012.[8] The President of Myanmar, U Thein Sein, a former general, surprised observers with what appeared to be a benevolent approach to government, and an apparent desire to allow some movement towards democracy in Burma. A major policy change occurred in September 2011 when Thein Sein suspended the construction of the Myitsone Dam in Kachin State. This was a massive dam being built by the Chinese to generate hydroelectricity for sale to China. This decision signalled a major change in Burma's policy towards China. Thein Sein also ordered the release of 100 political prisoners in October 2011 out of a total of 2,000, ostensibly as a sign of goodwill.[9] Several hundred more were released in January 2012.[10] The international community responded by awarding Burma the chairmanship of ASEAN for 2014, with the 24th and 25th ASEAN Summits being

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[6] Turnell, Sean, (2010, July 1), "Dissecting the Data: Burma's Macroeconomy at the Cusp of the 2010 'Election' ", Burma Partnership website. Retrieved from: http://www.burmapartnership.org/2010/07/dissecting-the-data/; and

Thant Myint-U, (2012), *op. cit.*

[7] Aung San Suu Kyi, (2011, April 24). On "Burma's Big Lie", Evan Williams, SBS Dateline. Retrieved from: http://www.sbs.com.au/dateline/story/about/id/601086/n/Burma-s-Big-Lie.

[8] Daniel, Zoe, (2011, November 18), "Suu Kyi tipped to run in new elections", ABC News. Retrieved from: http://www.abc.net.au/news/2011-11-18/suu-kyi-tipped-to-run-in-new-burmese-elections/3678580?section=world; and

Wai Moe, (2011, November 18), "NLD Decides to Re-register, Compete in Coming Elections", The Irrawaddy. Retrieved from: http://www2.irrawaddy.org/article.php?art_id=22492; and

Sai Zom Hseng, (2011, December 6), "NLD Yet to Decide Where to Contest By-Elections", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/article.php?art_id=22604; and

The Irrawaddy, (2012, February 7), "Thousands Cheer Suu Kyi on Bassein Campaign Trip". Retrieved from: http://www2.irrawaddy.org/article.php?art_id=22990.

[9] *The Guardian*, (2011, October 12), "Burma releases some political prisoners in amnesty". Retrieved from: http://www.theguardian.com/world/2011/oct/12/burma-political-prisoners-freed-amnesty.

[10] *The Irrawaddy*, (2012, January 17), "Burma's Remaining Jailed Dissidents". Retrieved from: http://www2.irrawaddy.org/article.php?art_id=22867.

held in Nay Pyi Taw.[11] The chairmanship of ASEAN was a position the government had keenly sought. The US also despatched its Secretary of State, Hillary Clinton, to visit Burma, the first visit by a US Secretary of State in over fifty years.[12] President Obama also visited Burma on two occasions: firstly in 2012 and again in 2014 to attend the 25th ASEAN Summit in Nay Pyi Taw. There was great hope after his first visit in 2012 that Burma would continue to move towards a democratic system of government.[13] However by 2014 this move towards democracy had slowed; it was clear Aung San Suu Kyi would not be allowed to run for election as President in 2015; and overall many were disappointed in Obama's lukewarm support of Aung San Suu Kyi and the National League for Democracy (NLD).[14] Indeed, the Obama administration appeared to be endorsing the government of U Thein Sein. In his 2014 visit, Obama stated:[15]

> *In part because of President Thein Sein's leadership, the democratization process in Myanmar is real.*

It seemed that the US was pulling closer to Thein Sein's quasi-civilian government and away from opposition groups such as the National League for Democracy.[16] By 2015 it was probably fair to say that the movement towards democracy had stalled rather than just slowed, evidenced by the violence by police towards

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[11] Zaw Win Than, (2011, May 9), "Myanmar 'ready' to chair ASEAN", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/national-news/2826-myanmar-ready-to-chair-asean.html; and

Burma Partnership, (2011, October 17), "ASEAN should delay Burma's chairmanship to help ensure it moves towards democratic transition and peace". Retrieved from: http://www.burmapartnership.org/wp-content/uploads/2011/10/BP-Briefer-ASEAN-Chairmanship-2014.pdf; and

The New Light of Myanmar, (2011, November 21), "ASEAN Foreign Ministers unanimously express their support to Myanmar to take Chairmanship of ASEAN in 2014". Retrieved from: http://www.burmalibrary.org/docs12/NLM2011-11-21.pdf; and

Boot, William, (2014, January 9), "Will the Asean Chair Strain Burma's Resources?", The Irrawaddy. Retrieved from: https://www.irrawaddy.com/business/will-asean-chair-strain-burmas-resources.html.

[12] Myers, Steven Lee, (2011, December 1), "U.S. Will Ease Some Limits on Myanmar, Clinton Says", The New York Times. Retrieved from: http://www.nytimes.com/2011/12/02/world/asia/us-will-relax-curbs-on-aid-to-myanmar.html?pagewanted=all; and

Peck, Grant, (2011, December 1), "Clinton Visit Gives Burma Respect it Craves", The Irrawaddy. Retrieved from: http://www2.irrawaddy.org/article.php?art_id=22573; and

Ba Kaung, (2011, December 1), "Clinton Delivers Small Carrots, Urges More Concrete Reforms, The Irrawaddy. Retrieved from: http://www2.irrawaddy.org/article.php?art_id=22580 .

[13] Clinton, Hillary Rodham, (2014), "Hard Choices", Simon & Schuster, New York, pp.101-126.

[14] Kyaw Zwa Moe, (2014, November 14), "Obama's Second Visit Falls Flat", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/commentary/obamas-second-burma-visit-falls-flat.html.

[15] *Ibid*.

[16] *Ibid*.

students in Letpadan.[17] National elections were held on 8th November 2015, but as in 2010 they were not really considered free nor fair, as the Constitution has not been amended to remove the 25% of seats in Parliament which are held by the military and which gives them a veto over constitutional amendments.[18] Nor has it been amended to remove the clause that bars Aung San Suu Kyi from becoming President. The result of the election was a landslide victory to the National League for Democracy who won 80% of the available seats, winning control of both houses of parliament.[19] In mid-March 2016 Htin Kyaw, a close ally of Aung San Suu Kyi, was elected by the parliament to be President, the first civilian leader to hold that position in fifty years.[20] Htin Kyaw stated that his appointment was "Aung San Suu Kyi's victory".[21] Aung San Suu Kyi declared that she would lead the country, in spite of the obstacles put in her way by the Constitution. The National League for Democracy took office on 1st April 2016, and within days it was announced that Aung San Suu Kyi would take on the role of State Counsellor, effectively the leader of the country.[22] She was also appointed as the Minister of Foreign Affairs. The world has readily accepted Aung San Suu Kyi as the *de facto* leader of Burma.[23]

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[17] *The Irrawaddy*, (2015, March 10), "Scenes of Indiscriminate Violence in Letpadan as Police Attack Ambulance Workers, Students, Reporter". Retrieved from: http://www.irrawaddy.org/photo/scenes-of-indiscriminate-violence-in-letpadan-as-police-attack-ambulance-workers-students-reporter.html.

[18] *The Associated Press*, (2015, July 11), "NLD Commits to Contesting November Election", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/burma/nld-commits-to-contesting-november-election.html; and

McLeod, Andrew, (2015, July 10), "Aung San Su Kyi still in running for Myanmar presidency", BBC News. Retrieved from: http://www.bbc.com/news/world-asia-33476250; and

Jagan, Larry, (2015, July 12), "Claims of foul play tarnish 'free and fair' polls", Bangkok Post. Retrieved from: http://www.bangkokpost.com/news/asean/620100/claims-of-foul-play-tarnish-free-and-fair-polls; and

Aye Min Soe, (2015, June 26), "Pyidaungsu Hluttaw votes down 5 of 6 changes to constitution", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-06-26.pdf.

[19] *BBC News*, (2015, November 13), "Myanmar election: Suu Kyi's NLD wins landslide victory". Retrieved from: http://www.bbc.com/news/world-asia-34805806; and

Cochrane, Liam, (2015, April 5), "Aung San Suu Kyi to become 'State Counsellor' of Myanmar", ABC News. Retrieved from: http://www.abc.net.au/news/2016-04-05/aung-san-suu-kyi-to-become-state-counsellor/7301994.

[20] *BBC News*, (2016, March 15), "Myanmar elects Htin Kyaw as first civilian president in decades". Retrieved from: http://www.bbc.com/news/world-asia-35808921.

[21] *Ibid*.

[22] Cochrane, (2015, April 5), *op. cit.*

[23] *The Globe and Mail*, (2016, April 7), "Stéphane Dion says Aung San Suu Kyi is the 'de facto' leader of Myanmar". Retrieved from: https://www.theglobeandmail.com/news/politics/stephane-dion-says-aung-san-suu-kyi-is-the-de-facto-leader-of-myanmar/article29550737/.

However, she is not without her detractors, with many criticising her government's handling of the persecution of the Rohingyas in Rakhine State.[24]

It is against this political backdrop that this thesis is set. The thesis will look at the railways of Burma, looking at their past, their state today and considering what changes are likely to happen or should happen in the immediate future.[25]

1.2 Literature Review

There is little empirical academic research specific to Burma in the area that this thesis is addressing. On infrastructure development in Burma, there are some articles in the press but very little in the academic literature. More broadly, there is a wide literature on the economic history of railway development, for example in the USA and the United Kingdom in the 1800's. This will be discussed in Chapter 2.

The literature on the topic of this thesis, the railways of Burma, divides into five categories:

1. Papers in academic journals.
2. Books and chapters in books.
3. On-line advocacy sites.
4. On-line media sites.
5. Miscellaneous sources: e.g. magazines, unpublished reports.

It is areas (1) and (2) which will be the main subject of this literature review, and to a lesser extent area (3). However, it is important to comment on areas (4) and (5) as they are an important element of research in Burmese Studies.

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[24] McPherson, Poppy, (2017, March 31), "Aung San Suu Kyi: Myanmar's great hope fails to live up to expectations", The Guardian. Retrieved from: https://www.theguardian.com/world/2017/mar/31/aung-san-suu-kyi-myanmars-great-hope-fails-to-live-up-to-expectations; and

ABC News, (2017, August 27), "Myanmar violence leaves 96 dead as Rohingya Muslims flee into Bangladesh". Retrieved from: http://www.abc.net.au/news/2017-08-27/rohingya-muslims-flee-myanmar-to-bangladesh-96-dead/8846566; and

Cochrane, Liam, (2017, August 29), "Rohingya militant group warns of 'war' against Myanmar Government: thousands flee clashes", ABC News. Retrieved from: http://www.abc.net.au/news/2017-08-28/rohingya-militant-group-warns-of-war-against-myanmar/8850406.

[25] A map of the current Myanma Railways' current network is shown at the start of this thesis, on Page xxiv. The source of the map is:

Wikipedia website, "Myanmar Railways". Retrieved from: https://en.wikipedia.org/wiki/Myanmar_Railways.

Some of the lines are as being "under construction", but it is questionable whether some of these will ever be constructed, for example the Kengtung to Mong Nai line which is discussed in Chapter 7 of this thesis.

1.2.1 Books and Papers in Academic Journals

The papers in peer-reviewed journals on infrastructure development in Burma specifically are quite sparse. The level of infrastructure development in Burma is very low compared to the rest of Southeast Asia. In a detailed study of the Burmese economy in 2007, Mya Than & Myat Thein presented the following figures, by creating an index of the level of infrastructure development, with a value of "1" representing a low level of development, and "5" a high level.[26]

Country	Airport	Seaport	Transport	Energy	Telecoms	Average
Singapore	4.9	4.9	4.6	4.4	4.7	**4.7**
Brunei	3.3	3.0	3.3	3.6	3.5	**3.3**
Malaysia	3.1	3.1	2.7	2.6	3.2	**2.9**
Thailand	3.1	3.1	1.6	2.7	3.0	**2.7**
Indonesia	3.0	2.4	2.3	2.6	2.7	**2.6**
Philippines	2.3	2.5	1.9	2.2	2.7	**2.3**
Vietnam	1.9	2.4	1.9	1.9	2.2	**2.1**
Burma	1.6	2.0	1.6	1.4	1.4	**1.6**
Cambodia	1.6	1.5	1.8	1.4	1.4	**1.5**
Laos	1.5	1.5	1.5	1.7	1.5	**1.5**

Table 1: Infrastructure in ASEAN countries (Lowest = 1 and Highest = 5).

The data presented in this 2007 paper were based on a decade earlier, 1997. In spite of the data being dated, it does illustrate how far behind Burma is compared to other ASEAN countries, with the exception of Laos and Cambodia.

The 2010/2011 and 2011/2012 Budgets from Burma revealed interesting trends in infrastructure development in Burma. In the 2010/2011 Budget, very little was allocated for infrastructure spending (only 3.2% of the Budget on areas such as rail, energy and electricity), as shown in Table 2.[27]

[26] Mya Than and Myat Thein, (2007), "Transitional Economy of Myanmar. Present Status, Developmental Divide, and Future Prospects", ASEAN Economic Bulletin, Vol. 24, No. 1, April 2007, pp.98-118.

[27] Turnell, Sean, (2013), "Reform and Its Limits in Myanmar's Fiscal State", in Cheesman, Nick, Monique Skidmore and Trevor Wilson (eds.), (2013), "Myanmar's Transition: Openings and Opportunities", Institute of Southeast Asian Studies, Singapore, pp.137-155.

Ministry	2010/11 (Kyat billions)	% of Total	US$ Equivalent 2010/11 ($m)
Defence	1,323.1	51.0	1,557
Construction	296.0	11.4	348
Education	266.9	10.3	314
Agriculture	199.4	7.7	235
Electricity	78.2	**3.0**	92
Health	73.4	2.8	86
Finance & Revenue	14.7	0.6	18
Rail	4.5	**0.2**	5
Energy	0.2	**0.0**	1
Other	337.8	13.0	398
Total	**2,594.2**	**100.0**	**3,052**

Table 2: The Government's 2010/2011 Budget.

However, the 2011/2012 Budget was noticeably different.[28]

Ministry	2011/12 (Kyat billions)	% of Total	US$ Equivalent 2011/12 ($m)
Defence	1,319	21.1	1,551
Energy	1,009	**16.2**	1,187
Electricity	669	**10.7**	787
Construction	578	9.3	680
Finance & Revenue	479	7.7	564
Communications	321	5.1	378
Agriculture	310	5.0	365
Education	310	5.0	365
Rail	208	**3.3**	245
Other	1,039	16.6	1,223
Total	**6,242**	**100.0**	**7,345**

Table 3: The Government's 2011/2012 Budget.

The three areas of energy, electricity and rail accounted for over 30% of the 2011/2012 Budget. This massive change highlights the significance of infrastructure development taking place in Burma at present. Expenditure on railway development was forecast to grow from 0.2% of the Budget in 2010/2011 to 3.3% in the 2011/2012 Budget.[29] In 2016 the Asian Development Bank (ADB)

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[28] *Ibid*.

[29] Some of Myanma Railways' budget is spent on "non-railway" items such as overpasses. For example, in August 2015 Myanma Railways completed the construction of a road overpass at Insein, at a cost of Kyat 6.2 billion, and will spend another Kyat 1.5 billion to build an additional tributary approach ramp. See

Soe Win, (2015, August 15), "New Insein overpass set to open on 17 August", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-08-15-red.pdf; and

Ko Moe, (2015, August 19), "New railway overpass to get extra tributary", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-08-19-red.pdf.

estimated that US$60 billion would need to be spent through to 2030 on transport infrastructure in Burma.[30] This is represents about 3-4% of Gross Domestic Product (GDP), compared to current levels of 1% of GDP.

Many of the books and the publications in the academic literature take a historical approach, examining what was built or was planned to be built. In the late 1800's studies were made about the feasibility of building a railway from central Burma to western China.[31] The Yunnan-Burma Railway was a British project to connect the Yunnan Province in south-west China to Burma, which had been under British rule since 1885. In the early 1920's, Sun-Yat Sen, the first president of China, had visions for railway expansion to link China with the rest of the world. This included a line from Yunnan Province in south-west China to the Arakan Coast.[32] In 2011 C. Raja Mohan summed up the plans nicely, writing that:[33]

> *What the British Raj could not do in Burma, Beijing is all set to accomplish in Myanmar – building a rail link between China's Yunnan province and the Bay of Bengal.*

Thant Myint-U highlights the economic and geopolitical impact this railway would have on Burma in the appropriately titled book "*Where China Meets India. Burma the New Crossroads of Asia*".[34] I am not aware of any research in the academic literature on this aspect of railway development in Burma. There is however an extensive literature on railway development in general. A leading figure in this area is Wolmar, who has pointed out that railways provide an enduring boost to the

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[30] *The Global New Light of Myanmar*, (2016, April 20), "US$60 billion needed to improve Myanmar's transport infrastructure". Retrieved from: http://www.burmalibrary.org/docs22/20_April_16_gnlm.pdf; and

Lewis, Simon, (2016, July 30), "ADB Has Tips on Transportation Improvements", The Irrawaddy. Retrieved from: http://www.irrawaddy.com/business/the-irrawaddy-business-roundup-july-30-2016.html; and

Asian Development Bank, (2016, July), "Myanmar Transport Policy Note: Summary for Decision-Makers". Retrieved from: http://www.adb.org/publications/myanmar-transport-sector-policy-note-summary-decision-makers.

[31] Rastorfer, Jean-Marc, (1992), "By Rail to Loikaw?" A paper presented at the Colloquium on Burma Studies held at Northern Illinois University in November 1992. (A copy of this paper is in my possession.); and

Bugrova, Maria, (2007), "The British expeditions to China in XIX century", The Bumali Project. Retrieved from: http://bumali.com/03expeditions.shtml; and

Crozier, Ralph C., (September 1962), "Antecedents of the Burma Road: British Plans for a Burma-China Railway in the Nineteenth Century", Journal of Southeast Asian History, Vol. 3, No.2, pp.1-18.

[32] Sun Yat-Sen, (1920), "The International Development of China", Commercial Press Ltd, Shanghai.

[33] Mohan, C. Raja, (2011, September 1), "Burma rail", The Indian Express. Retrieved from: http://www.indianexpress.com/news/burma-rail/839924/.

[34] Thant Myint-U, (2011), *op. cit*.

economy because of the employment opportunities they create.[35] Roads, once built, just need minor maintenance to patch up any defects, whereas railways need continual maintenance with regular patrols checking the tracks, as well as many workers to operate the railway system. Another advantage is that the development of railways sees monopolies or market strangleholds broken; an increase in the number of suppliers; and communities being able to access goods and markets from beyond their own community.[36]

One interesting aspect of railway development in Myanmar is its importance to its neighbours to the west, namely India and Bangladesh.[37] A possible link with India is discussed in Chapter 8, as is Bangladesh's long term plans to build a rail link to Burma via Gundam in Rakhine State.

Garver highlights how in the mid-1990's sources in China began to speak of an "Irrawaddy corridor" which would connect the province of Yunnan in south-west China to the Bay of Bengal.[38] The corridor was a road and river one. A new road was to be built from China to Bhamo on the Irrawaddy River, where goods would be loaded on barges to go downriver to Minbu, where another road link would be built to the Arakan Coast.[39] However, considerations of weather systems and river navigation issues meant that there would need to be major investment in both roads and river navigation (e.g. dredging). The onset of the Asian Crisis in 1997 put an end to this plan. One of the original drivers of this road and river transport plan was the state of the railways in Burma. As Garver points out:[40]

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[35] Wolmar, Christian, (2009), "Blood, Iron, & Gold. How the Railroads Transformed the World", Public Affairs, New York, p.231.

[36] *Ibid*.

[37] Priyodesk, (2012, January 26), "Revival of railways: DCCI places 15-point proposal", Priyo News. Retrieved from: http://news.priyo.com/business/2012/01/26/revival-railways-dcci-places-1-45976.html; and

Democracy for Burma, (2010, September 1), "Bangladesh and China Keen to Construct Tri-Nation Road and Rail Link Via Burma". Retrieved from: https://democracyforburma.wordpress.com/2010/09/01/bangladesh-and-china-keen-to-construct-tri-nation-road-and-rail-link-via-burma/; and

The Daily Star, (2010, August 10), "China keen on road, rail links". Retrieved from: http://archive.thedailystar.net/newDesign/news-details.php?nid=152823.

[38] Garver, John W., (2001), "Protracted Contest. Sino-Indian Rivalry in the Twentieth Century", University of Washington Press, Seattle and Washington, pp.266-270.

[39] *Ibid.*, pp.268-269.

[40] *Ibid*., p.268.

Appendix B of this thesis briefly describes the four track gauges: metre gauge, standard gauge, broad gauge and narrow gauge.

This road and river corridor had the advantage of avoiding the use of the antiquated (1-m) gauge, dangerous (frequent derailments), slow (to avoid derailments and damage to the light-gauge rails), and crowded railway line connecting Lashio to Mandalay with Yangon.

The Chinese solution is to build a standard-gauge railway all the way to the Arakan Coast, as is discussed in Chapter 4 of this thesis. Garver is the only author whom I have come across who has addressed the issue of gauge and risks such as derailment and damage to the rails. The question of gauge has geopolitical consequences in the region.

There is little discussion yet in the academic literature on the development of the port and industrial estate at Dawei. One important contribution has been made by Zaw & Kudo, who conducted surveys in Yangon, Mandalay, Moulmein and Dawei.[41] Thant Myint-U has discussed the Dawei project in the context of Burma's position in the region.[42] The discussion in the academic literature is mainly of a geopolitical nature. For example, Garver discussed the implications of this port for Sino-Indian relations.[43] Some work at Dawei was underway as early as 2002.

Garver also highlights the strategic importance of the deep-sea port at Kyaukphyu to China:[44]

The most ambitious and potentially significant Chinese project in Myanmar was the construction of an integrated transportation system linking China's Yunnan with the Kyaukphyu port on the northern end of Ramree Island.

Thant Myint-U also discusses the significance to China of the port at Kyaukphyu.[45] A major new railway may be built from Yunnan Province to Kyaukphyu; the oil and gas pipelines have been constructed from Kyaukphyu to Yunnan; and the port itself will provide a transit point for both crude oil and dry goods to be transported to China. The oil will go via the pipeline and the dry goods by rail. A key result of the construction of the port at Kyaukphyu and the oil and gas pipelines is that it will

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[41] Zaw, Myinmo and Toshihiro Kudo, (2011), "A Study on Economic Corridors and Industrial Zones, Ports, and Metropolitan and Alternative Roads in Myanmar". In:

Ishada, Masami (ed.), (2011), "Intra- and Inter-City Connectivity in the Mekong Region", BRC Research Report No. 6, Bangkok Research Center, IDE-JETRO, Bangkok, Thailand. Retrieved from: http://www.ide.go.jp/library/English/Publish/Download/Brc/pdf/06_chapter5.pdf.

[42] Thant Myint-U, (2011), *op. cit.*, pp.318-319.

[43] Garver, John W., (2002), "The security dilemma in Sino-Indian relations", India Review, 1:4, pp.1-38.

[44] *Ibid.*, p.16.

[45] Thant Myint-U, (2011), *op. cit.*, p.216.

provide a partial solution to China's "Malacca Dilemma".[46] At present China relies heavily on ships, especially oil tankers, travelling through the Straits of Malacca with cargoes bound for China. If there is unrest in the Straits of Malacca, China's supply lines will be disrupted. You Ji highlighted China's strong dependence on ship-borne energy resources, especially oil, saying they "formed the bedrock of energy security" for China.[47] Whilst the oil pipeline is the key component on solving China's Malacca Dilemma, the significance of a railway from south-west China to Kyaukphyu should not be discounted.

1.2.2 The On-Line Advocacy Sites and Media Sites

The primary on-line site with commentary and news about Burma is *The Irrawaddy* that is published by a group based in Chiang Mai in northern Thailand. *The Irrawaddy* was strongly opposed to the former military government in Burma. Within Burma there is the government newspaper *The Global New Light of Myanmar* which is published daily. The quality of journalism in the past was poor but is now improving, but it is a good source of information and up-to-date news on Burma. Another useful source of information is the *Myanmar Times*, an independent business-oriented newspaper. Examples of advocacy sites are the Burma Rivers Network and the Shwe Gas Movement.[48] The first is opposed to the massive expansion in hydropower dams planned in Burma; the second is voicing concern on to how the natural gas reserves exports from the Shwe Gas Field in the Bay of Bengal are not benefiting the Burmese people. At present there is no advocacy site commenting on railway construction in Burma.

There is a blurring of the boundaries between the on-line advocacy sites and the on-line media sites. For example, *The Irrawaddy* is a good source of current news on Burma, but it is heavily biased against the former military government, and thus can also be viewed as an advocacy site. However, the information found in on-line media sites such as *The Irrawaddy* provides a kernel of information that

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[46] Reddy, Vidya Sagar, (2016, September 16), "Reinforcing China's Malacca Dilemma", Center for International Maritime Security. Retrieved from: http://cimsec.org/reinforcing-chinas-malacca-dilemma/28117.

[47] You Ji, (2007), "Dealing with the Malacca Dilemma: China's Effort to Protect its Energy Supply", Strategic Analysis, Vol. 31, pp.467-489.

[48] *Burma Rivers Network* website, http://www.burmariversnetwork.org/; and

Shwe Gas Movement website, http://www.shwe.org/.

drives this research project. *The Irrawaddy* website, the government publications *The Global New Light of Myanmar* and its predecessor *The New Light of Myanmar*, as well as expensive fieldwork that I have carried out in Burma over a number of years, are the key sources of much of the raw material for this thesis.

1.2.3 Other Sources

There are a number of other sources of useful information for this research project. These sites are quite objective (unlike the advocacy sites and on-line media sites). Three such sources are:

- United Nations Economic and Social Commission for Asia and the Pacific, i.e. UNESCAP (based in Bangkok, Thailand).[49]
- Asian Development Bank.[50]
- *Railway Gazette.*[51]

The *Railway Gazette* has provided what little discussion there is of the modern state of the railway network in Burma. In 2004 Hettler gave an update on the state of Myanma Railways.[52] Hettler is a German railway engineer who was involved in delivering 28 Krupp diesel locomotives to Burma Railways in 1964.[53] He clearly has an extensive knowledge of the rail network in Burma. Hettler also highlighted the number of isolated lines in Burma that were built for essentially political purposes. These are slowly being joined up to the rest of the Myanma Railways network. In 2013 Hettler discussed the various lines in the network – existing ones, ones under construction and proposed ones – suggesting that the network would soon be 10,000 *km* in length.[54] Hettler is probably too optimistic when he considers what Myanma Railways can achieve on the construction side. For example, when discussing lines in the north of Burma (where there is a line from Mandalay to Myitkyina) Hettler stated that:[55]

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[49] United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) website, http://www.unescap.org/.

[50] *Asian Development Bank (ADB)* website, http://www.adb.org/.

[51] *Railway Gazette Newsletter* website, http://www.railwaygazette.com/news.html.

[52] Hettler, Dieter, (2004, November 1), "Update from Myanmar", Railway Gazette. Retrieved from: http://www.railwaygazette.com/news/single-view/view/update-from-myanmar.html.

[53] Personal communication, by email, from Mr Dieter Hettler on 11th November 2016.

[54] Hettler, Dieter, (2013, August), "Myanma Railways eyes a 10000 km network", Railway Gazette International, Vol. 169, Issue 8, pp.40-46.

[55] *Ibid*., p.44.

The old main line [80] serving the northern city of Myitkyina was completed as long ago as 1898, but MR has now started work on another north-south route [68] running farther east. The Myitkyina-Leikha line is said to be 762.7 km long.

This proposed line runs very near to Hsipaw. I visited Hsipaw in late 2012 and the construction of a line from Hsipaw to Laikha had been abandoned some time before.[56] This is a major portion of the line to which Hettler is referring.

Similarly, Hettler refers to work on the Dawei-Myeik line in the south of the country. I visited Dawei in 2012 and 2013. At the time of the second visit, construction had been abandoned.[57] The Deputy Minister for Rail Transportation, U Chan Maung indicated in response to a question in the Pyithu Hluttaw that construction of the line from Dawei to Myeik is now included in the five-year plan from 2016 to 2021.[58]

1.3 Railway Development in Burma

Planned railway development in Burma falls into five main groups:

- The upgrade of the Yangon to Mandalay line.
- Upgrades of the line from Mandalay to Myitkyina, the line from Yangon to Moulmein and possibly Dawei, and the Yangon to Pyay line.
- The upgrade of the Circular Railway in Yangon and the possible eventual construction of an elevated railway and/or underground railway.
- Construction of some smaller rural lines, such as the Sittwe to Minbu line.
- Longer term, the construction of a railway from Yunnan Province in south-west China to Kyaukphyu on the Arakan Coast in Burma, along the so-called Ruili-Kyaukphyu economic corridor.[59]

"MR" stands for "Myanma Railways". The "*[80]*" and "*[68]*" refer to a numbering system Hettler has developed for the railway lines in Burma. See, for example, Map 8 in Chapter 4 and Map 36 in Chapter 8.

[56] Stubbs, Lindsay, (2012, November 26), "The Hsipaw-Laikha-Namsang Railway. A Railway for the Military?" Unpublished manuscript, Macquarie University.

[57] Hettler, (2013, August), *op. cit.,* p.45; and

Stubbs, Lindsay, (2012, March 31), "The Railway at Dawei". Unpublished manuscript, Macquarie University.

[58] *The Global New Light of Myanmar*, (2015, July 14), "MP calls for halt to car manufacturing at local industrial zones". Retrieved from: http://www.burmalibrary.org/docs21/AH-PH-2015-07-14-en.pdf.

[59] McCartan, Brian, (2011, January 8). "China outward bound through Myanmar", Asia Times. Retrieved from: http://www.atimes.com/atimes/Southeast_Asia/MA08Ae01.html; and

Boot, William, (2010, December 13). "China Plans New Railway Links to Yangon, Burma Coast", The Irrawaddy. Retrieved from: http://www2.irrawaddy.org/print_article.php?art_id=20303; and

Myanma Railways has ambitious plans. A master plan published by the Ministry of Transport and Communications in early 2017 listed five railway projects to which priority would be given.[60] These are projects to upgrade the following lines:

- The Yangon-Mandalay line (385 miles).
- The Mandalay-Myitkyina line (340 miles).
- The Yangon-Moulmein line (176 miles).
- The Yangon-Pyay line (160 miles).
- The Circular Railway in Yangon (29 miles).

These lines cover 80 per cent of the country, and the estimated cost of the upgrading all lines in Burma is US$60 billion. This is wishful thinking as such funds will not be available. The work on the Circular Railway in Yangon will cost about US$200 million.

1.3.1 A Railway from China to the Bay of Bengal

Oil and gas pipelines have been built by China from Kunming in south-west China to Kyaukphyu in Burma, on the Arakan Coast on the Bay of Bengal. A high-speed railway line for goods trains may one day run parallel to the pipelines. Construction of the line was due to start in December 2011, but after the suspension of the construction of the Myitsone Dam on the upper Irrawaddy River, the China-Burma rail link was put on hold. The successful completion of both the gas and oil pipelines and the smooth transition to the operating phase of the oil pipeline in early 2017 may encourage China to once again consider the merits of a railway linking China and Burma. This line will be discussed in Chapter 4 of this thesis.

The proposed line from Yunnan Province in China to Kyaukphyu can be seen in the context of what some observers see as China's global plans for expansion. LeVine considers that China is building the most extensive global commercial-military empire in history.[61] He cites major infrastructure programs around the

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The Global New Light of Myanmar, (2015, August 19), "Myanmar, China discuss construction of Ruili-Kyaukpyu economic corridor". Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-08-19-red.pdf.

[60] *The Global New Light of Myanmar*, (2017, April 20), "Transport authorities prioritise railway project". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-04-20-red.pdf.

[61] LeVine, Steve, (2015, June 9), "China is building the most extensive global commercial-military empire in history", Quartz. Retrieved from: http://qz.com/415649/china-is-building-the-most-extensive-global-commercial-military-empire-in-history/.

world, such as railway construction in Africa, pipeline and railway construction in South America and railway construction in Southeast Asia.[62] There is a startling similarity between the proposed Yunnan-Burma Railway and the proposed 1,125 mile China-Pakistan Railway from Kashgar in China through Pakistan to the port of Gwadar on the Arabian Sea. The line is shown in Map 3 below.[63]

Map 3: The proposed China-Pakistan Railway.

The estimated cost of the line is US$3.7 billion, and is part of a package of over US$45 billion that China plans to spend in Pakistan on infrastructure in order to open up new trade routes.[64] This proposed railway from Kashgar to Gwadar is seen as a part of the solution to China's Malacca Dilemma, as is the Yunnan-Burma railway line.[65]

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[62] Jackson, Chris, (2016, June), "Standard gauge line to open next year", Railway Gazette International, pp.36-38; and

Railway Gazette, (2016, December 20), "Kenyan standard gauge locomotives unveiled". Retrieved from: http://www.railwaygazette.com/news/freight/single-view/view/kenyan-standard-gauge-locomotives-unveiled.html; and

BBC News, (2017, May 31), "Kenya opens Nairobi-Mombasa Madaraka Express railway". Retrieved from: http://www.bbc.com/news/world-africa-40092600; and

Railway Gazette, (2015, June 7), "Tanzanian standard gauge contracts announced". Retrieved from: http://www.railwaygazette.com/en/news/personnel/single-view/view/tanzanian-standard-gauge-contracts-announced.html; and

The Citizen, (2016, May 16), "China to take over Tazara in new plan". Retrieved from: http://www.thecitizen.co.tz/News/China-to-take-over-Tazara-in-new-plan/1840340-3205138-kqg4wh/index.html.

[63] The map is sourced from:

LeVine, (2015, June 9), *op. cit.*

Kashgar is also known as *Kashi* in Chinese.

[64] Reddy, (2016, September 15), *op. cit.*

[65] *Ibid*.

1.3.2 Construction of Other Railways in Rural Burma

In October 2010 Myanma Railways announced the planned construction of thirteen new railways in various parts of rural Burma. These are shown Table 4.[66]

	Railway	Length (Miles)
1	Myitkyina - Bhamo - Momeik - Kyaukme - Hsipaw - Laikha - Namsang	475
2	Kyangin - Pakokku	320
3	Sittwe - Ann - Minbu	257
4	Mongnai - Kengtung	226
5	Toungoo - Yado - Loikaw	150
6	Dawei - Myeik	133
7	Monywa - Kani - Mingin - Kalewa - Kalaymyo	125
8	Pyay (Shwedaga) - Toungoo (Kyeedaw) - Nay Pyi Taw	120
9	Nay Pyi Taw - Hsinthe - Taikon - Pinlaung	120
10	Katha - Bhamo	98
11	Pyabwe - Natmauk - Magway	95
12	Pathein (Begarat) - Eine - Nyaungdon - Yangon (Hlinethaya)	89
13	Hinthada - Danubyu - Sakkawt (Nyaungdon)	48
		2,256

Table 4: Thirteen smaller railways that were planned for Burma.

Some of these smaller railways will never be built. A good example is the Myitkyina to Namsang line, which is little more than wishful thinking. In December 2012 I visited the site of the start of a railway from Hsipaw to Laikha in the south. This is a part of the proposed Myitkyina to Namsang line. The only visible work was some earthworks that were starting to be overgrown with weeds and undergrowth.[67] More telling was the Myanma Railways' building nearby, probably a site office, where large maps of the proposed routes were displayed. The building was not in use, but was left in the care of a caretaker. Work on the Dawei

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[66] Moe Myint Lin Let, (2010, October 30), "Railroad networks cover the whole country", The New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs09/NLM2010-10-30.pdf; and

The New Light of Myanmar, (2010, October 28), "When Kyangin-Pakokku Railroad Project is completed, local products can be transported to arid regions at low cost". Retrieved from: http://www.burmalibrary.org/docs09/NLM2010-10-28.pdf; and

The New Light of Myanmar, (2010, October 20), "With prevailing peace and stability, the State has built infrastructures in various sectors for regional development. Prime Minister on tour of Shan State (North)". Retrieved from: http://www.burmalibrary.org/docs09/NLM2010-10-20.pdf.

Kyaw Ye Min, (2011, April 26), "Special projects – guarantees of brighter future of nation and people (2)", The New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs11/NLM2011-04-26.pdf.

The details in Table 4 are taken from the article by Kyaw Ye Min in April 2011. There were some small changes in the descriptions of the lines, and also in the lengths. For example, the line from Myitkyina is described as ending at Namsang rather than Laikha, which makes sense.

[67] This site is north of Hsipaw on the Hsipaw-Lashio road.

to Myeik line has been suspended, and what track has been built is not useable.[68] I visited Dawei in December 2011 and again in December 2013, and was told that the section of the line that had been built (about 20 miles of track) could not be used as some of the track and some bridges had collapsed. Part of the Pathein to Yangon via Einme line has been constructed but is of little use except for a daily diesel railcar between Pathein and Einme, where the line terminates.[69] The Kyangin to Pakokku line has been constructed, and is operating, but not for its entire length. This line will be examined in Chapter 5 of this thesis.

The task of Myanma Railways is not easy: not only must it deal with decades of neglect in its network and a lack of funding from the government in Nay Pyi Taw, but also with the forces of nature such as the widespread flooding that occurred in Burma in July and August 2015.[70] For example, the city of Kalaymyo with a population of 131,000 was only accessible by air during the floods.[71] Kalaymyo is isolated from the rest of the rail network in Burma, as will be discussed in Chapter 5. Future railway construction needs to take the likelihood of flooding into consideration, which only adds to the cost of construction. However, given the magnitude of the 2015 floods, damage to the railway network in the rural regions is inevitable.[72] The damage bill from the 2015 floods was initially reported at Kyat

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[68] Stubbs, (2012, March 31), *op. cit.*

[69] In this thesis I use the term "railcar" to refer to a self-propelled railway vehicle designed to transport passengers.

[70] *The Global New Light of Myanmar*, (2015, August 1), "Four regions, states severely hit by floods: gov't". Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-08-01-red.pdf; and

BBC News, (2015, August 2), "Myanmar floods: UN says death toll 'to rise' ". Retrieved from: http://www.bbc.com/news/world-asia-33750690; and

ABC News, (2015, August 2), "Myanmar monsoon, flooding and landslides leaves 47 dead, thousands stranded". Retrieved from: http://www.abc.net.au/news/2015-08-02/severe-flooding-in-myanmar-kills-27-hampers-rescue-effort/6665922; and

Aye Min Soe, (2015, August 6), "Death Toll Rises. 69 Perish in Floods, 270,000 Affected", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-08-06-red.pdf; and

The Irrawaddy, (2015, August 10), "Burma Floods: Over 1 Million People Affected, Nearly 100 Dead". Retrieved from: http://www.irrawaddy.org/burma/burma-floods-over-1-million-people-affected-nearly-100-dead.html.

[71] *BBC News*, (2015, August 2), *op. cit.;* and

Department of Population, Ministry of Immigration and Population, (2015, May), "The 2014 Myanmar Population and Housing Census. The Union Report.", Census Report, Volume 2, p.53. Retrieved from: http://myanmar.unfpa.org/sites/default/files/pub-pdf/Census%20Main%20Report%20%28UNION%29%20-%20ENGLISH_0.pdf.

[72] Flood damage to tracks and bridges was reported on the Mandalay-Myitkyina line and the Hinthada-Pathein line in the Irrawaddy Delta. There was also extensive damage to the lines near Kalaymyo, as well as other regions. See:

3.8 billion (about US$3 million), with damage in Rakhine State, and the Sagaing, Magway, Ayeyawady and Bago regions.[73] The Mandalay-Myitkyina line was re-opened in mid-August 2015 after being cut off since mid-July. Myanma Railways requested extra funding from the government in Nay Pyi Taw to repair the damage, saying the repair work could only be carried out if such funding was received. The repair bill to the network after the 2015 floods was later revised upward to Kyat 6.3 billion (about US$4.9 million).[74] Myanma Railways does not have an easy task, given the havoc the forces of nature can cause to its network.[75]

1.3.3 The Suburban Railway in Yangon

A major upgrade of the Circular Railway in Yangon is currently underway. In addition, there are long-term plans for an elevated railway and underground rail system in Yangon, similar to the ones in operation in Bangkok and Beijing. These plans were announced in 2012 by the then Minister for Rail Transportation, Aung Min.[76] The government is in talks with interested companies in the US, Germany, Japan and Singapore for the possible construction of these lines. The upgrade of

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The Global New Light of Myanmar, (2015, August 6), "Myitkyina-Mandalay train service to resume". Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-08-06-red.pdf; and

The Global New Light of Myanmar, (2015, August 7), "Trains to resume on Hinthada-Pathein section". Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-08-07-red.pdf; and

The Global New Light of Myanmar, (2015, August 15), "Restoration of Mandalay-Myitkyina train service under way". Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-08-15-red.pdf.

This article reported that the rail service had been suspended from 17th July 2015 due to severe damage from the floods, with flood waters not receding until 12th August 2015.

[73] Soe Win, (2015, August 19), "Railroad damage bill more than K3.8 bil.: gov't", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-08-19-red.pdf.

[74] Kyaw Hsu Mon, (2015, October 9), "$4.9m Repair Bill for Rail Network after Flood Damage", The Irrawaddy. Retrieved from: https://www.irrawaddy.com/news/burma/4-9m-repair-bill-for-rail-network-after-flood-damage.html; and

The Global New Light of Myanmar, (2015, October 4), "Myanma Railways revises K 6.3 billion budget for rebuilding damaged rail tracks". Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-10-04-red.pdf.

[75] Lewis, Simon, (2015, August 22), "Railway Ministry Requests Extra Funding to Repair Flood Damage", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/business/the-irrawaddy-business-roundup-aug-22-2015.html; and

Soe Win, (2015, August 19), *op. cit.*

The Global New Light of Myanmar, (2015, August 6), *op. cit*.

[76] Petty, Martin and Aung Hla Tun, (2012, February 15), "Myanmar eyes skytrain, underground for biggest city – minister", Reuters. Retrieved from: http://www.reuters.com/article/2012/02/15/idUSL4E8DF43T20120215.

the Circular Railway and the proposed plans for an elevated railway and/or underground railway are discussed in Chapter 8.

1.4 Plans for Railways from Asia to Europe

For a number of years plans have been made to link Asia to Europe by rail, with the principal purpose being haulage of freight. One plan is the Trans-Asian Railway and would involve Burma building some "missing" links if it were ever to go ahead. A more recent plan is China's One Belt One Road Project, which in many ways supersedes the Trans-Asian Railway. It is more likely to eventuate than the Trans-Asian Railway given China's growing economic strength and China's heavy investment in the rail sector.[77] Both plans are briefly discussed below.

1.4.1 The Trans-Asian Railway

The Trans-Asian Railway is a project to construct a freight railway from Europe to Asia. The project was hatched in the 1960's and is overseen by the United Nations Economic and Social Commission for Asia and the Pacific, known as UNESCAP. Most of the lines exist, but there are some key missing links, including in Burma.[78] The Trans-Asian network comprises 117,500 *km* of railway lines serving 28 member countries. The United Nations compares it to the famous Silk Road, as it

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[77] CRRC Corp. of was formed in 2015 from the merger of China's two largest train manufacturers. CRRC's orders in 2016 were greater than the combined revenue from railway business of Germany's Siemens AG and Canada's Bombardier Inc. Siemens and Bombardier are now looking to combine their rail operations. See:

Henning, Eyk, Alex Webb and Frederic Tomesco, (2017, April 11), "Siemens, Bombardier Said in Talks to Combine Rail Units", Bloomberg. Retrieved from: https://www.bloomberg.com/news/articles/2017-04-11/siemens-bombardier-said-in-talks-to-combine-train-operations; and

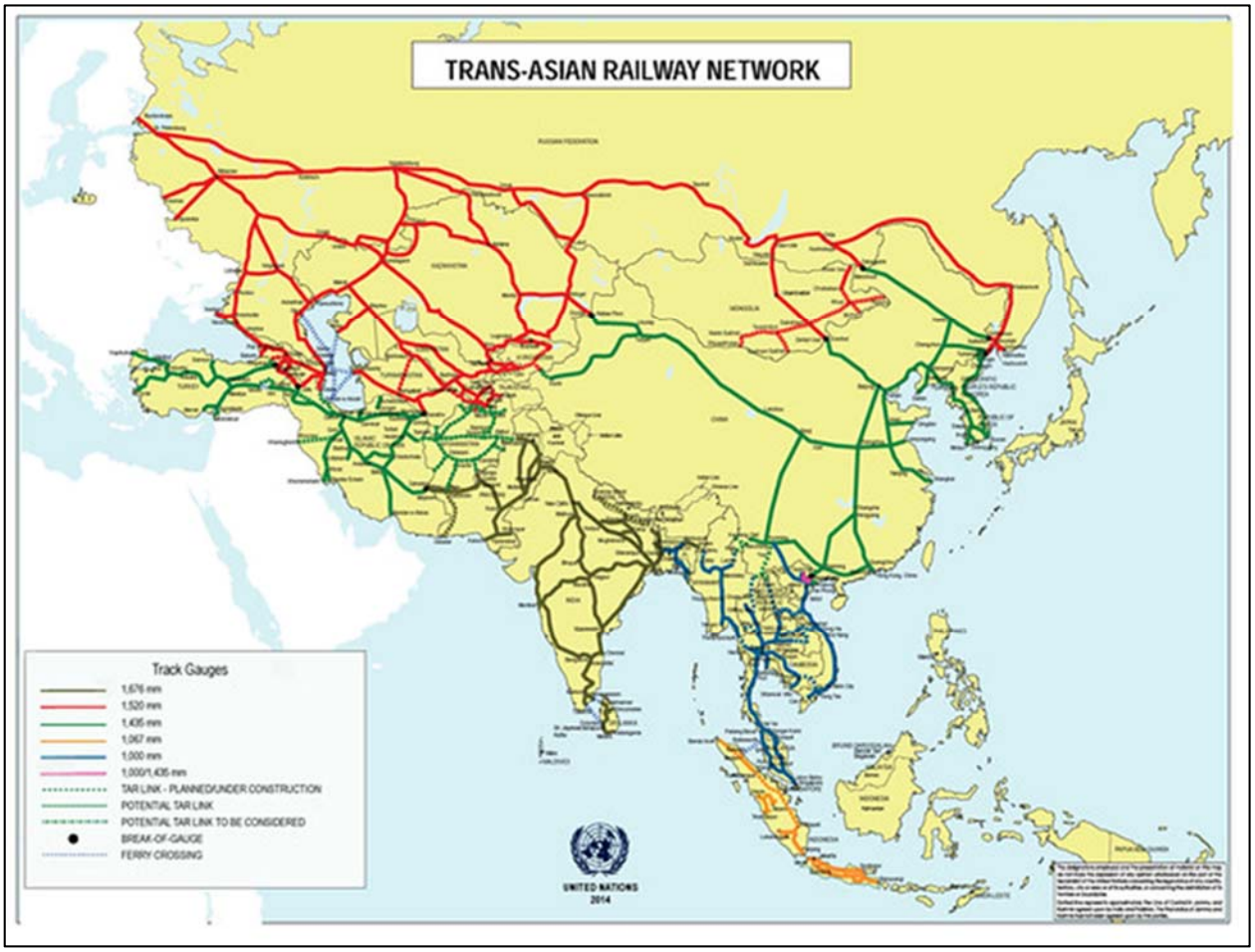
Belt and Road Portal, (2017, March 20), "CRRC goes full steam ahead abroad". Retrieved from: https://eng.yidaiyilu.gov.cn/qyfc/zqzx/9699.htm.

[78] *Economic and Social Commission for Asia and the Pacific*, (2000), "Development of the Trans-Asian Railway: Trans-Asian Railway in the Southern Corridor of Asia-Europe Routes", United Nations, New York; and

Stubbs, Lindsay, (2011, May 11), "The Trans-Asian Railway and its Implications for Burma". Unpublished manuscript, Macquarie University; and

Roy, Pinaki, (2009, February 7), "Trans-Asian Railway project finally set to take off", The Daily Star. Retrieved from: http://archive.thedailystar.net/newDesign/news-details.php?nid=74779.

aims to serve cultural exchanges and trade within Asia and between Asia and Europe.[79] The Trans-Asian Railway is shown in Map 4.[80]



Map 4: The Trans-Asian Railway.

Thailand would welcome progress being made with the Trans-Asian Railway, as this would fit in with its strategy for Thailand to be a transport gateway to the upper ASEAN countries (Thailand, Cambodia, Laos, Vietnam and Burma).[81] A proposed line from India to Burma is one of the missing links in the Trans-Asian Railway. This line is discussed in Chapter 8.

A standard-gauge line is planned from Dawei in southern Burma to Kanchanaburi and across Thailand in the so-called East-West Economic Corridor

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[79] *Economic and Social Commission for Asia and the Pacific* website, "Trans-Asian Railway". Retrieved from: http://www.unescap.org/our-work/transport/trans-asian-railway/about.

[80] *Economic and Social Commission for Asia and the Pacific* website, "Trans-Asian Railway Network Map". Retrieved from: http://www.unescap.org/resources/trans-asian-railway-network-map.

[81] Sukmanop, Chula, (2012, February 29), "Connecting Thailand with ASEAN and to the World". A PowerPoint presentation delivered by Dr Chula Sukmanop, Inspector General, Ministry of Transport, at the ASEAN Business Forum held in Bangkok on 28th - 29th February 2012. (A copy of this presentation was sent to me by the Thailand Management Association on 12th March 2012).

to Cambodia.[82] This line can also be regarded as a part of the Trans-Asian Railway, and will be discussed in Chapter 8. Another link which was viewed as being a part of the Trans-Asian Railway is a proposed link to connect Chittagong and Cox's Bazar in Bangladesh to Burma, crossing into Burma at Gundam in Rakhine State.[83] A potential line from Cox's Bazar to Burma is discussed in Chapter 8. In 2009 this line was seen as a part of the Trans-Asian Railway. The plans in 2009 were for a metre-gauge line from Dohazari in Bangladesh to Gundam. The view of Bangladesh Railway was:[84]

> *Gundum point will be a railway junction from where a track will extend to Cox's Bazar town to facilitate tourist movement and another towards Chittagong. The TAR would connect Bangladesh at three points from the Indian state of West Bengal, and have a single exit point at Gundum.*

By 2017 plans for the line are for a dual-gauge line from Dohazari to Cox's Bazar to Gundam in Burma, with funding coming from the Asian Development Bank.[85]

1.4.2 China's One Belt One Road Project

Plans for the Trans-Asian Railway have probably been superseded by China's One Belt One Road project, also known as the New Silk Road project.[86] At a two-day summit in Beijing in May 2017, President Xi Jinping of China hosted 28 world leaders, including Aung San Suu Kyi. He put forward a very ambitious plan for a

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[82] Fernquest, Jon, (2015, January 28), "Thai-Japan railway to link Burma & Cambodia", Bangkok Post. Retrieved from: http://www.bangkokpost.com/learning/learning-from-news/461169/thai-japan-railway-to-link-burma-cambodia.

[83] Roy, (2009, February 7), *op. cit.; and*

Kaladan Press, (2009, February 12), "Communication minister visits Bangladesh-Burma border". Retrieved from: http://www.kaladanpress.org/index.php/news/93-news-2009/february-2009/1775-communication-minister-visits-bangladesh-burma-border.

"Gundum" is an alternative spelling for Gundam. "TAR" stands for Trans-Asian Railway.

[84] Roy, (2009, February 7), *op. cit.*

[85] *Railway Gazette,* (2016, September 28), "ADB approves largest ever railway financing package". Retrieved from: http://www.railwaygazette.com/news/infrastructure/single-view/view/adb-approves-largest-ever-railway-financing-package.html?cHash=bc637db6877e6bb026e865ce30a9a7a8&sword_list[]=myanmar&no_cache=1.

[86] Carney, Matthew, (2017, May 14), "China wants 'new Silk Road' One Belt One Road project to help it dominate world trade", ABC News. Retrieved from: http://www.abc.net.au/news/2017-05-14/china-plans-new-silk-road-to-dominate-world-trade/8522682.

This project was launched in 2013 by President Xi Jinping. See:

Hofman, Bert, (2015, December 4), "China's One Belt One Road Initiative: What we know thus far", The World Bank website. Retrieved from: http://blogs.worldbank.org/eastasiapacific/china-one-belt-one-road-initiative-what-we-know-thus-far.

network of new trade routes across the world, involving both land and maritime routes, pledging US$124 billion for this project.[87] There will be a network of highways, railways and maritime routes, and a key feature of the project will be to link China to Europe and the UK.[88] This will create new markets for goods from China as well as expanding China's sphere of influence in the world. The project also highlights the value of using rail to transport freight. Already goods trains are travelling from China to Germany, with the trains being two kilometres in length and taking 13 days to reach their destination.[89] In April 2017 a goods train travelled from the UK to Yiwu in China, taking nearly three weeks for the trip.[90] Map 5 below shows the planned land and maritime routes under the One Belt One Road project.[91]

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[87] Goh, Brenda and Yawen Chen, (2017, May 14), "China pledges $124 billion for new Silk Road as champion of globalization", Reuters. http://www.reuters.com/article/us-china-silkroad-africa-idUSKBN18A02I.

[88] *The Economist*, (2017, May 4), "The belt-and-road express. China faces resistance to a cherished theme of its foreign policy. Silk routes are not always as appealing as they sound." Retrieved from: http://www.economist.com/news/china/21721678-silk-routes-are-not-always-appealing-they-sound-china-faces-resistance-cherished-theme; and

McVeigh, Tracy, (2017, January 15), "Silk Road route back in business as China train rolls into London", The Guardian. Retrieved from: https://www.theguardian.com/world/2017/jan/14/china-silk-road-trade-train-rolls-london.

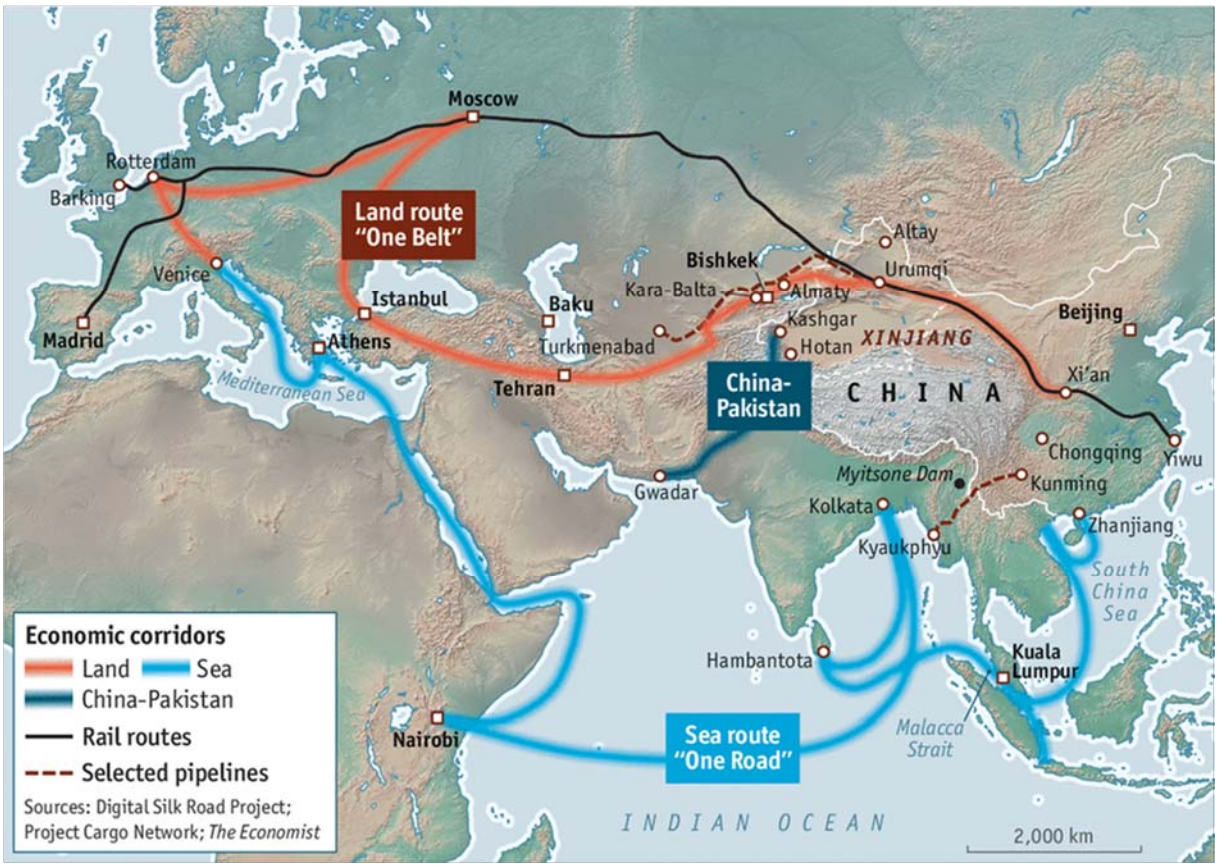
[89] Carney, (2017, May 14), *op. cit.*

[90] *Ibid*.

Earlier in the year, in January 2017, a goods train with 34 wagons took 16 days from Yiwu in China to London. See:

McVeigh, (2017, January 15), *op. cit.*

[91] *The Economist*, (2017, May 4), *op. cit.*



Map 5: China's One Belt One Road project.

This map shows the China-Burma oil and gas pipelines, but not the proposed China-Burma Railway, which would follow a similar route. India refused to send an official delegation to the summit in Beijing, reflecting its displeasure at the inclusion of the China-Pakistan Corridor as a part of the One Belt One Road project.[92] This is a US$57 billion trade corridor through Pakistan that also crosses the disputed territory of Kashmir.[93] Not surprisingly, given that China is a neighbour of Burma, Aung San Suu Kyi attended this summit.[94] The Minister for Transport and Communications, U Thant Zin Maung also attended.[95] Burma's main interest in the One Belt One Road project will be the deep-sea port at

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[92] *Forbes*, (2017, May 15), "India Objects to China's One Belt and Road Initiative – And It Has A Point". Retrieved from: https://www.forbes.com/sites/alyssaayres/2017/05/15/india-objects-to-chinas-one-belt-and-road-initiative-and-it-has-a-point/#1dde2506b262; and

Apurva, Shubhajit Roy, (2017, May 14), "One Belt One Road: China-Pakistan warmth, India skips summit", Indian Express. Retrieved from: http://indianexpress.com/article/india/one-belt-one-road-summit-china-india-pakistan-cpec-4654401/.

[93] A proposed railway along this corridor from Kashgar to the port city of Gwadar is shown in Map 3 above.

[94] *The Global New Light of Myanmar*, (2017, May 15), "State Counsellor attends Belt and Road Forum in Beijing". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-05-15-red.pdf.

[95] *The Global New Light of Myanmar*, (2017, May 16), "State Counsellor and world leaders attend China talks". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-05-16-red.pdf.

Kyaukphyu in Rakhine State. China is looking to take up to an 85% stake in this port, which plays a key role in the Maritime Silk Road.[96] So important is Kyaukphyu to China that it is being suggested that China is willing to abandon the suspended Myitsone Dam project in exchange for a favourable outcome with Kyaukphyu. From a railway perspective, if the One Belt One Road project does go ahead, it increases the likelihood of the China-Burma Railway being built. This proposed railway is the topic of Chapter 4.

1.5 The Preference of the Government for Road Investment

What is clear in Burma, whether under the current NLD government or former military ones, is the preference for investment in road rather than rail. This can be seen in Figures 1 and 2 below:[97]

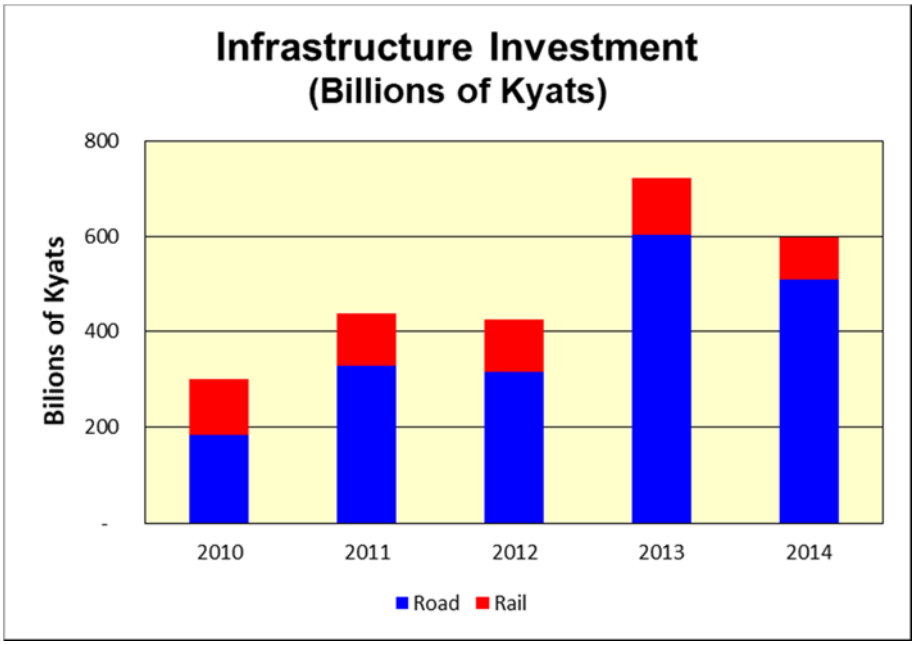

Figure 1: Infrastructure investment in Burma, 2010 to 2014.

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[96] *The Irrawaddy*, (2017, May 12), "Where Does Burma Stand on China's 'One Belt, One Road?' ". Retrieved from: https://www.irrawaddy.com/opinion/editorial/burma-stand-chinas-one-belt-one-road.html; and

Lee, Yimou and Shwe Yee Saw Myint, (2017, May 5), "Exclusive: China seeks up to 85 percent stake in strategic port in Myanmar", Reuters. Retrieved from: http://www.reuters.com/article/us-china-silkroad-myanmar-port-exclusive-idUSKBN1811DF.

[97] *Ministry of Rail Transportation,* (2015, November 23), "Developing a Myanma's Rail Network that meet demand". Retrieved from: http://www.unescap.org/sites/default/files/Myanmar-TAR-WGM-4.pdf.

The years in this graph are for the financial year ended 31st March.

In Figure 2 below, road and rail investment are expressed as a percentage of the total investment in the two. In 2010 investment in rail was 39% of the total investment in rail and road. By 2014 this figure had fallen to 15%.

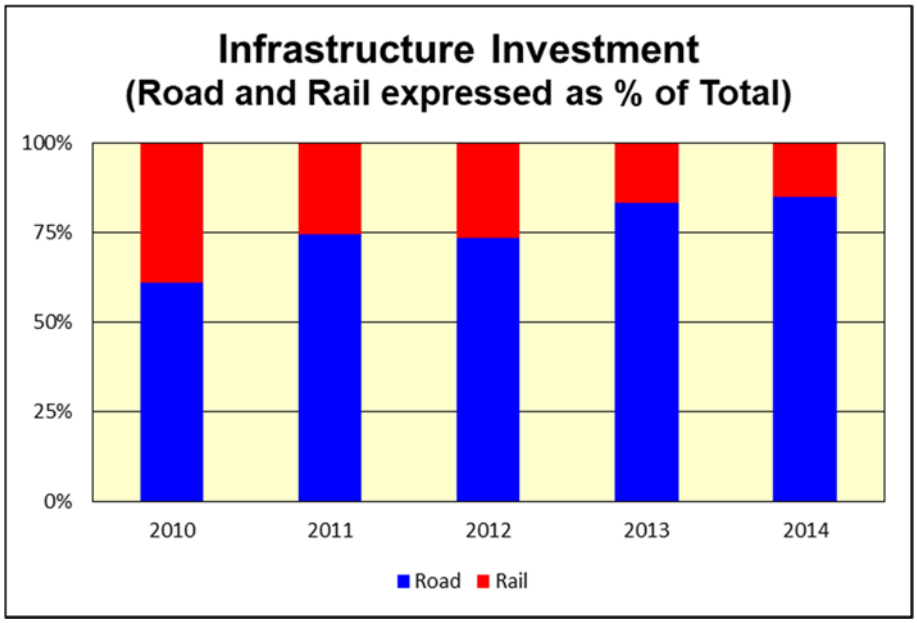

Figure 2: Infrastructure investment, with road and rail expressed as a percentage of the total.

In April 2017 when speaking at a co-ordination meeting on a national energy policy Aung San Suu Kyi declared that transportation and electricity were key to jobs and development.[98] In her speech, Aung San Suu Kyi said:

> *In the transport sector, there were places that could not be accessible in some seasons. In some places there was no electricity available. If the problems of electricity and roads in these places are solved on a self-help basis, economic advantages can be implemented. Only if transport and electricity is better will foreign investors be interested in investing in the country.*

Roads extend to all parts of the country, whereas rail cannot, so it is understandable that a greater amount is spent on roads than rail. Aung San Suu Kyi mentions roads in this speech, but not rail. The problem that Myanma Railways faces is that its budget is tight. It faces the perennial problem of should it only be

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[98] *The Global New Light of Myanmar,* (2017, April 26), "Daw Aung San Suu Kyi: Transportation, electricity are keys to jobs, development". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-04-26-red.pdf.

Aung San Suu Kyi stressed the importance of electricity being available throughout the nation when visiting a village for a peace talk in Mandalay Region in August 2017. She stressed that it was one of the priorities for the country. See:

The Global New Light of Myanmar, (2017, August 8), "State Counsellor stresses peace efforts, pledges nationwide electricification". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-08-08.pdf.

operating areas of business where profitability may be achievable (e.g. passengers and freight on the Yangon-Mandalay line; the Circular Railway in Yangon) or should its main objective be one of providing a service to the country, which will involve operating branch lines in rural areas that are not and can never be profitable. This problem, which in many ways is a philosophical one, will be addressed in Chapter 2 of this thesis where railway finance is examined.

1.6 The Significance of this Research Project

This research project is significant because of the crucial position in which Burma finds itself in at this time: it has great opportunities to catch up with the rest of Asia, but may not take them. India is one of Burma's neighbours, and it has taken its opportunities. Jawaharlal Nehru spoke of India's tryst with destiny in a famous speech in 1947 on the eve of India's Independence. Nehru proclaimed: [99]

> *A moment comes, which comes but rarely in history, when we step out from the old to the new, when an age ends, and when the soul of a nation, long suppressed, finds utterance.*

Whether Burma can also step out from the old to the new remains to be seen. There are two possible outcomes: the wealth of the natural resources may perpetuate the suppression in Burma; or the wealth from its natural resources such as gas and hydropower may help this country emerge from fifty years of suppression. The development of infrastructure such as railways, ports, the oil and gas pipelines and hydropower dams are central to the development of these natural resources. It is the study of the railway development that is the topic of this thesis. This research project should also be significant since, as revealed in the review of the literature, there are no similar academic studies of railway development in Burma.

1.7 Impact of this Research Project from an Academic and Community Perspective

Burma was regarded as a pariah state for nearly 50 years, from the time of General Ne Win's coup in 1962 to late 2010 when Aung San Suu Kyi was released from house arrest and the quasi-military government was showing signs of a transition

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[99] Nehru, Jawaharlal, (1947), "Speech On the Granting of Indian Independence, 14 August 1947". Modern History Sourcebook. Internet History Sourcebook Project. Retrieved from: http://www.fordham.edu/halsall/mod/1947nehru1.html.

(albeit very slow) to democracy. Burma is now advancing economically. There is much development in Yangon, with new buildings, shopping centres and factory complexes under construction. Four new banks were opened 2010.[100] Tourism is also growing strongly, with 4.7 million international tourists visiting Burma in the year ended 31st March 2016 compared to 3.4 million in the corresponding period in the previous year.[101] Tourist numbers increased by 22% in January and February 2017 compared to the same period in the previous year. The growth in tourism and investment in Burma has seen several new airlines launched since 2010.[102] These are listed in Table 5 below.[103]

Airline	Commenced Operations
Air KBZ	2010
Asian Wings Airways	2011
Golden Myanmar Airlines	2012
FMI Air	2014
Mann Yadanarpon Airlines	2014
Union Express Charter Airline	2014
APEX Airlines	2015

Table 5: New airlines launched in Burma since 2010.

Growth in Gross Domestic Product (GDP) in real terms has been strong, being in the range 6.5% to 8.0% for the last three financial years (from 2015 to 2017), and

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[100] *The Irrawaddy*, (2010, June 24), "Burma Relaxes Banking Regulations". Retrieved from: http://www2.irrawaddy.org/article.php?art_id=18716; and

Nayee Lin Latt, (2010, July 23), "Owners of New Private Banks Can't Raid the Till", The Irrawaddy. Retrieved from: http://www2.irrawaddy.org/article.php?art_id=19044.

[101] *Central Statistical Organization* website, "Selected Monthly Economic Indicators", Ministry of Planning and Finance, Nay Pyi Taw. Retrieved from: http://www.csostat.gov.mm/csomonthly.asp; and

Hinshelwood, Colin, (2012, February 9), "Rangoon Hotels Struggle to Meet Tourist Demand", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/article.php?art_id=23002; and

Ye Myint, (2015, April 26), "Myanmar on track to receive record 5 m. foreign tourists in 2015", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-04-26.pdf.

[102] Wai Moe, (2010, October 7), "Tay Za Forms New Airline", The Irrawaddy. Retrieved from: http://www2.irrawaddy.org/article.php?art_id=19673; and

Zaw Win Than, (2011, March 28 – April 3), "Kanbawza to launch domestic airline on April 11", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/lifestyle/travel/3220-kanbawza-to-launch-domestic-airline-on-april-1.html; and

Wikipedia website, "List of airlines of Myanmar". Retrieved from: https://en.wikipedia.org/wiki/List_of_airlines_of_Myanmar.

[103] Yangon Airlines was suspended from operations in December 2010, but recommenced operations in October 2011. See:

Wikipedia website, "List of airlines of Myanmar", *op. cit.*

forecast to be around 7.0% for the next two financial years. These figures are summarised in Table 6.[104]

Year ended 31st March	Real GDP Growth (% p.a.)
2015	8.0%
2016	7.3%
2017 (est.)	6.5%
2018 (est.)	6.9%
2019 (est.)	7.2%

Table 6: Real GDP growth in Burma.

Research on Burma at this point in its history is important, in order to enable a clearer understanding of the political and economic landscape within the country. The development of the railways will have an economic impact and there can be major political ramifications as well. The visits by the US Secretary of State, Hillary Clinton, and President Barack Obama led to a normalization of the long-strained relations between the US and Burma.[105] No doubt there will continue to be changes in the planned railway development in Burma, changes that occur because of the changing political landscape within the country and because of its changing international position.

1.8 Outline of the Thesis

Chapter 1 has served as an introduction to place the importance of railway development in Burma in context with events in the country today. Chapter 2 will examine the economic impact of railways, drawing on evidence from other countries. Chapter 3 is the major chapter of this thesis and takes a statistical overview of the railways in Burma. This is achieved by pulling together economic

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[104] Turnell, Sean, (2017, February 16), "Myanmar Economic Update 2017". A paper presented at the Myanmar Update Conference that was held at the Australian National University, Canberra on 17-18 February 2017. The title of the conference was "Transformations. Myanmar Update 2017". (A copy of the presentation was kindly supplied to me by Dr Turnell.)

The International Monetary Fund estimated the GDP growth for the 2017 financial year to be 8.1%. See

Jagtiani, Sunil, (2017, March 9), "Myanmar Wants to Modernize Its Banking System", Bloomberg. Retrieved from: https://www.bloomberg.com/news/articles/2017-03-08/myanmar-to-vet-state-banks-to-protect-asia-s-top-growing-economy.

[105] Ba Kaung, (2011, December 2), "Clinton Concludes Landmark Burma Trip", The Irrawaddy. Retrieved from: http://www2.irrawaddy.org/article.php?art_id=22591.

Jagan, Larry, (2011, December 2), "Burma's Mann Meets Clinton", Radio Free Asia. Retrieved from: http://www.rfa.org/english/commentaries/clinton-12022011165135.html.

statistics on the railways, the inland waterways and rice production from sources such as the Statistical Yearbooks (1961 to 2015).[106] Earlier data from other sources are also used, with some of the data going back to the 1870's when railway construction commenced in Burma. Fieldwork has played an important role in this thesis, and I have travelled on many of the lines in Burma, observing and gathering information. Some of this fieldwork will be used in Chapter 3. The key conclusion of this chapter is that the freight side of Myanma Railways' business has slipped badly. Chapter 4 will focus on the proposed China-Burma railway. There have been plans to build this going back a century. New plans have emerged in this decade and were quickly shelved by China, but are now possibly back on the agenda. Chapters 5 and 6 give insight into the rural lines in Burma, drawing heavily on the fieldwork in Burma. The first case study will examine the Kyangin-Pakokku line on the west bank of the Irrawaddy River, and the second case study will discuss the line from Aungban to Loikaw. Chapter 7 examines railways in Shan State, concentrating on the line from Thazi to Shwe Nyaung and Yasauk; the now abandoned line from Shwe Nyaung to Taunggyi; the line from Taunggyi to Mong Nai; and the proposed Shan State Railway from Kengtung to Mong Nai. Chapter 8 covers a number of smaller but important topics listed below. The last topic, on the Arakan Light Railway, whilst not important today, is of historical interest.

- A proposed railway from India to Burma.
- Long-term plans for a railway from Bangladesh to Burma.
- A possible railway from Dawei to Thailand.
- The importance to the railways of peace in Burma.
- Upgrading the Yangon to Mandalay line.
- The line from Mandalay to Myitkyina.
- The transport of pulses.
- The modernisation of the Circular Railway in Yangon.
- The failed attempt to re-establish a tram service in Yangon.

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[106] At the time of writing (August 2017), the latest Statistical Yearbook available is the 2016 edition, and the latest *Selected Monthly Economic Indicators* is the November 2016 edition. The delay in the publication of the *Statistical Yearbook 2015* was puzzling, with no yearbooks being published for 2012, 2013 or 2014. Graphs in this thesis which utilise data from the Statistical Yearbooks include editions from 1961 up to the 2015 one. The Central Statistical Organization website indicates that the 2016 edition of the Statistical Yearbook has been published, but it is only available in Nay Pyi Taw and Yangon. See

Central Statistical Organization website, *op. cit*.

- An optical fibre cable network along the railway lines.
- The minister responsible for Myanma Railways.
- A line from Sittwe to Minbu.
- The Arakan Light Railway.

The final chapter, Chapter 9, draws together the key conclusions from this research and suggests other areas of possible research. Details of presentations at two international conferences related to this thesis and one publication (an article published in *The Journal of Burma Studies*) are given in Appendix C.

This is a thesis based on empirical work. The topics examined are supported by fieldwork conducted from 2010 to 2018, with regular trips of a month or more to Burma in December, January or February, travelling mainly by rail. Photographs taken on these trips are used to illustrate points being made.

1.9 Conclusion

Burma is at a critical stage in its history, with the forces of democracy looking to overcome the military rule that held the country back for so many years. The political landscape is changing quickly, and this in itself presents challenges for this research project. The political reform is in many ways due to the sanctions imposed by the West. As an article in *The Economist* in 2012 pointed out:[107]

> *Many presumed that these sanctions did not worry the generals because they could rely on Chinese aid instead. Not so. Particularly in northern Myanmar, the often arrogant and sometimes brutal behaviour of Chinese companies in the end alienated even the government. … Thus the generals have been obliged to turn back to the West, and political reform.*

What is apparent is that whilst there is movement on the political reform front, economic reform is lagging behind.[108] Many foreign politicians and business people have visited Burma to meet with the government and Aung San Suu Kyi since late 2010. A number of foreign banks have opened offices in Yangon, and

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[107] *The Economist*, (2012, February 6), "Myanmar's startling changes. Pragmatic virtues. Unravelling the mysteries of a – so far – peaceful revolution". Retrieved from: http://www.economist.com/node/21547261.

[108] Turnell, Sean, (2012, February 10). Quoted in:

McDonald, Hamish, (2012, February 10), "Tractors may have replaced horses, but country still decades behind", The Sydney Morning Herald, p.8. Retrieved from: http://www.smh.com.au/world/tractors-may-have-replaced-horses-but-country-is-still-decades-behind-20120209-1rwvi.html.

foreign investment is gathering pace rapidly.[109] Aung San Suu Kyi has warned the foreign business community to be cautious about rushing in to invest in Burma.[110] Her view is:[111]

> *I think it [business people] should wait and see a little, for their own good as well as the country, … I think I's not just a matter of potential investments but also a matter of the potential of the country to cope with the investments.*

This thesis entitled "*The Railways of Burma – Their Past, Present and Future*" is timely, given the state of flux Burma is in at present.

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[109] Kyaw Hsu Mon, (2015, January 16), "Record Foreign Direct Investment Smashes Government Forecasts", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/business/record-foreign-direct-investment-smashes-government-forecasts.html.

[110] Murdoch, Lindsay, (2012, February 12), "Suu Kyi cites graft in urging business caution", The Sydney Morning Herald. Retrieved from: http://www.smh.com.au/world/suu-kyi-cites-graft-in-urging-business-caution-20120209-1rwvg.html; and

AsiaOne, (2012, February 9), "Aung San Suu Kyi wants to see Myanmar surpass Asean members". Retrieved from: http://news.asiaone.com/News/AsiaOne%2BNews/Asia/Story/A1Story20120209-326748/3.html.

[111] Aung San Suu Kyi, (2012), quoted in:

Murdoch, (2012, February 12), *op. cit.*

Aung San Suu Kyi was speaking to a delegation of the ASEAN Business Council in Yangon in February 2012.

Chapter 2

THE ECONOMIC BENEFIT AND IMPACT OF RAILWAYS

2.1 Introduction

The economic benefit and impact of railways has been studied for many years. The purpose of this chapter is to examine the economic impact and benefit of railways by taking a broad-brush approach, drawing from the literature what is viewed to be the key economic benefit and economic impact of railways, and to discuss how relevant or important railways are to modern-day Burma.

This chapter will first look at some of the economic history of railway development. The discussion will then move to a broader examination of the contribution of railway infrastructure to economic development, with some comparisons to Burma. This will be followed by a brief but important section on cost-benefit analysis, followed by an examination of the implications for the railways in Burma of a major report released by the former military government in late 2012 entitled "*Framework for Economic and Social Reform*". The next topic is a comparison of the railways in Burma with railway infrastructure in Africa. Africa is chosen as it is a very poor continent and also because parallels can be drawn with Burma on the historical front, as many parts of Africa were colonised by European powers. Some recent World Bank reports on transport infrastructure in Africa are the basis of this section. The role of railways in developing empire in colonial times is also examined. The chapter concludes with a discussion of railway finance, and raises the question of how heavily should government subsidise railways in order to achieve some of the economic benefits discussed in this chapter.

2.2 The Economic History of Railway Development

Sir John Clapham's "*An Economic History of Modern Britain. The Early Railway Age 1820-1850*" is the classic work on the economic history of railway

development.[1] Prior to the early 1800's England's canal network was growing strongly. Initially railways were seen as feeders to the canals and rivers, but the Canal Age ended quickly with the railways gaining dominance.[2]

Another important author on railways is Christian Wolmar, who has written a number of books on railways. In "*Fire & Steam. A History of the Railways in Britain*" Wolmar examines not just the Victorian period of growth and development of the railways in Britain, but he also discusses the twentieth century. For example, he points out that:[3]

> *By the 1860's virtually every town, village and hamlet was clamouring to be connected to this growing machine.*

There are some parallels with Burma, with the proliferation of new lines in rural regions, such as the ones listed in Table 4 in Chapter 1. Discussing the 1840's in Britain, Wolmar suggests that there were many unnecessary and uneconomic railways being built.[4] For example, by 1843 there were 1,800 miles of railway compared to only 250 miles in 1838. In Burma I have noticed a number of small lines that seem to be unnecessary, and would certainly be uneconomic. Wolmar also discusses how the trains used to make lengthy stops, e.g. for refreshments, 'comfort stops', and taking on water.[5] One hundred and seventy years later in Burma, the trains on the branch lines are making lengthy stops: to load and unload the goods van at the rear of mixed passenger/goods trains; and to wait for trains to pass from the opposite direction.[6] This is not too dissimilar to what Wolmar is describing in the 1840's.

Work on the expansion of the railways in North America is also a very fertile area of economic history. Pierre Berton's "*The Last Spike: The Great Railway, 1881-1885*", describes the construction of the Canadian Pacific Railway.[7] Berton explains the political and economic reasons for building the railway. In Canada,

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[1] Clapham, J.H., (1926), "An Economic History of Modern Britain. The Early Railway Age 1820-1850", Cambridge University Press.

[2] *Ibid*., p.89.

[3] Wolmar, Christian, (2007), "Fire & Steam. A New History of the Railways in Britain", Atlantic Books, London, p.xiii.

[4] *Ibid.,* p.75.

[5] *Ibid.,* p.77.

[6] On a trip from Aungban to Loikaw in December 2013 my train waited 1 hour and 40 minutes for the northbound train to pass.

[7] Berton, Pierre, (1971), "The Last Spike: The Great Railway, 1881-1885", McClelland & Stewart, Toronto.

the construction of the railway from eastern Canada to British Columbia in the west in the 1880's was a nation-building event. The Canadian Pacific Railway was instrumental in the settlement of western Canada. The key driving force behind the railway was the Prime Minister, Sir John A. Macdonald, whose actions are described as follows:[8]

> *But it was Macdonald's intention to defy nature and fashion a nation in the process. His tool, to this end, would be the Canadian Pacific. It would be a rare example of a nation created through the construction of a railway.*

However in modern-day Burma, the railway construction planned is not a nation-building exercise, but it could be argued that it does help to keep the nation together. In colonial times it was a different story however, and the spread of railways throughout Burma no doubt helped Britain maintain a firm grip in ruling Burma.

It is likely there are strong parallels between Burma and India where the first railway was built in 1853 and Independence was achieved in 1947. There are strong arguments to suggest that the railways were nation building in India. Kerr suggests that:[9]

> *The railroads . . . . were at the infrastructural core of the making of the modern Indian state and nation. The railroads influenced, directly and indirectly, much of what occurred in colonial and postcolonial India.*

Gandhi was more blunt, stating:[10]

> *It must be manifest to you, that, but for the railways, the English could not have such a hold on India as they have.*

The railways in India helped Britain maintain control as troops could be quickly moved to trouble spots. Nevertheless, there were benefits to India as a whole. There was a development of knowledge and skills and organisational ability running the railways. Such knowledge was transferred from the British to the Indians. This transfer was just as important as the physical technology of locomotives, rails, bridges, signals, *etc*.[11] The expansion of the railways in colonial

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[8] Berton, Pierre, (1972), "The Impossible Railway. The Building of the Canadian Pacific", Alfred A. Knopf, New York, p.11.

[9] Kerr, Ian J., (2006), "Engines of Change. The Railroads that Made India", Praeger, London, p.9.

[10] Gandhi, M. K., (1997), "*Hind Swaraj* and Other Writings", edited by Anthony J. Parel, Cambridge University Press, Cambridge, p.47.

[11] Myanma Railways is purchasing new coaches from Japan as a part of the upgrade of the Circular Railway in Yangon (See Chapter 8). But the Japanese government is not only providing physical technology. The

times saw national markets with converging prices for grain develop in the 1880's.[12] Working with the Post Office, the railways facilitated the bulk shipment of newspapers, books and magazines.[13] A key impact was the saving of time – both for passengers and for the shipment of commodities. The Indian statesman, Madhav Rao, writing in 1891 stated:[14]

> *In my various journeys it has repeatedly struck me that if India is to become a homogeneous nation, and is ever to achieve solidarity, it must be by means of the Railways as a means of transport, and by means of the English language as a medium of communication.*

Modern-day India has achieved solidarity, and the railways have played and continue to play a key role in this. India has the largest railway network in the world. It is not hard to see the similarities to Burma. In colonial Burma the railways played an important role, with lines such as from Rangoon to Prome and Rangoon-Mandalay-Myitkyina helping build British control of Burma. Burma has many different ethnic groups, an issue which is at the forefront of the politics in the country today. The railways help link most, but not all, of the different ethnic groups. The eventual construction of the Shan State Railway and a line from Sittwe to Minbu would aid this linking role that the railways are playing. In modern-day Burma, the railway construction planned is not a nation-building exercise, but it could be argued that it would help to keep the nation together.

Most studies of railway development have been for well-developed countries, such as the United States or Great Britain. By contrast, Coatsworth studied railway development in Mexico in the so-called Porfiriato Era (1877-1910).[15] He

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Deputy Minister for Technical Affairs from the Japan's Ministry for Land, Infrastructure, Transport and Tourism, Mr Takashi Owaki, has said that software infrastructure enlargement is a keep element of the support that Japan is providing to help develop Burma's transport sector. See:

Khaing Thanda Lwin, (2015, September 1), "Japan to grant $207 million loan for Yangon Circular Line upgrade", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-09-01-red.pdf.

[12] Kerr, (2006), *op. cit*., p.12.

[13] *Ibid.*

[14] Quoted in:

Kerr, (2006), *op. cit*., p.4.

[15] Coatsworth, John, (1974), "Railroads, Landholdings, and Agrarian Protest in the Early Porfiriato", The Hispanic American Historical Review, Vol.54, No. 1, (Feb.1974), pp.48-71; and

Coatsworth, John H., (1979), "Indispensable Railroads in a Backward Economy: The Case of Mexico", Journal of Economic History, Vol. XXXIX, No. 4 (December 1974), pp.939-960; and

Coatsworth, John H., (1981), "Growth Against Development: The Economic Impact of Railroads in Porfirian Mexico", Northern Illinois University Press, DeKalb, USA.

considered these studies to be representative of railway development in less developed countries, and found stark differences to the studies of the US and Great Britain. The unit savings on passenger travel were small, but the unit savings on freight operations were enormous.

Wolmar examined railways on a worldwide scale, concluding that there were economic reasons for railway expansion.[16] Wolmar also highlighted some of the social and political reasons behind railway construction around the world:

- To subdue colonies or indigenous populations.
- To transport armies.
- To bypass unnavigable stretches of river.
- To build and unite nations.

All of these points are relevant to modern-day Burma in varying degrees. For example, transporting freight or passengers on the Irrawaddy River can be affected by low water levels in the dry season. This problem is avoided with rail.

Wolmar also addresses the issue of gauge, noting that "gauge cannot, unfortunately, be dismissed as a mere technical matter". This is very important to Burma in relation to the possible construction of the standard-gauge China-Burma Railway and the possible linkage by rail to India, a country with a predominantly broad-gauge rail network. Broader gauge railways are more expensive to construct. There is also the issue of the "loading gauge", which Wolmar defines as: [17]

> *the size of the 'envelope' required to accommodate trains, which determines the size of tunnels, the location of platforms, the placement of lineside equipment.*

The wider the gauge, the wider will be the loading gauge, and the greater the expense of construction. The debate over gauge has been a perennial issue in the construction of railways around the world, and there is likely to be a similar debate with China's plans to build standard-gauge lines through Burma, Thailand and Laos.

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[16] Wolmar, (2009), *op. cit.*

[17] *Ibid.*, p.3.

2.3 The Contribution of Railway Infrastructure to Economic Development

The economic transport literature suggests a contribution by the railways to the economy in the following areas:[18]

- Reduced costs of production.
- Increase in tourism.
- Shifting demand.
- Breakdown of monopolies or market strangleholds.
- Assistance to internal costs of production, e.g. moving coal.

There is a quite broad literature on infrastructure and economic development, usually exploring particular regions or countries.

Banister & Berechman examined transport investment and economic development, with an emphasis on developed countries, using the Buffalo Light Rail Transport system in the US as a case study, comparing it to the San Francisco Bay Area Rapid Transit (BART) system.[19] Such quality of information is not available for Burma. In a later publication, Banister & Berechman examined the linkage between transport investment and the promotion of economic growth, but once again, it is for well-developed economies.[20]

There has been some work on developing countries. Ozment examined the transportation contributions to the economic performance of developing countries, focusing on 44 countries in Africa.[21] The author concluded that whilst transportation improvements do contribute to economic growth, there is little empirical evidence to support that premise. Thirlwall has considered growth and development, with special reference to developing countries.[22] Thirlwall draws on

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[18] *Ibid*., p.231.

[19] Banister, David, and Joseph Berechman, (2000), "Transport Investment and Economic Development", Spon Press, London and New York.

[20] Banister, David and Yossi Berechman, (2001), "Transport investment and the promotion of economic growth", Journal of Transport Geography, Vol. 9, pp.209-218.

[21] Ozment, John, (2006), "Assessing Transportation Contributions to the Economic Performance of Developing Countries", University of Arkansas. Retrieved from: http://ww2.mackblackwell.org/web/research/ALL_RESEARCH_PROJECTS/1000s/1048-ozment/MBTC%201048.pdf.

[22] Thirlwall, A.P., (2006), "Growth & Development. With Special Reference to Developing Economies", 8th ed., Macmillan, London.

a World Bank report from 1994 that was devoted to the topic of "*Infrastructure for Development*".[23] The report concluded that:[24]

> *Infrastructure can deliver major benefits in economic growth, poverty alleviation, and environmental sustainability – but only when it provides services that respond to the effective demand and does so efficiently.*

The key messages from the report were:

- Manage infrastructure like a business, not a bureaucracy.
- Introduce competition.
- Give users and other stakeholders a strong voice and real responsibility.
- Public-private partnerships in financing have promise.
- Governments will have a continuing, if changed, role in infrastructure.

One can see how these points apply in Australia, for example, but is much harder to apply them to Burma given the less-developed state of the economy, and the transition to democracy that is happening at the national government level. Nevertheless, the report does provide good insight into how to examine the relationship between infrastructure and growth in a country such as Burma. Poverty is a key issue in Burma, with most of the poor living in the rural areas of the country. Any improvement in infrastructure in Burma (especially in railways, roads and supply of electricity) should see an improvement in farm productivity and non-farm rural employment.[25]

Investment in railway infrastructure is usually justified on the basis that the benefits achieved by investing in railways exceed the costs of doing so. On a broader perspective, investment in railway infrastructure is justified on the grounds that there are both employment and development benefits.[26] The discussion here needs to be restricted to what is feasible for Burma. Clearly there are benefits to a country's economy of construction of high-speed rail networks such as the *Shinkansen* in Japan or the ever-growing high-speed rail network in China, but the likelihood of a high-speed rail line being built in Burma in the near future is virtually

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[23] *World Bank*, (1994), "World Development Report 1994. Infrastructure for Development", Oxford University Press.

[24] *Ibid*., p.2.

[25] *Ibid*., p.3.

[26] Banister and Berechman, (2000), *op. cit.*, p.257.

zero.[27] Investment in traditional rail infrastructure will be beneficial for a country such as Burma for the following reasons:

- The construction of a modern suburban railway in major cities such as Yangon or Mandalay will have two key impacts: (1) saving time for people travelling to and from work; (2) reduction in traffic congestion enabling road traffic to move more freely.
- Development and improvement of the major lines (namely Yangon-Mandalay and Yangon-Moulmein) should see a greater number of people using rail, taking pressure off the road and highway systems.
- Development and improvement of the branch lines in the rural areas of Burma will not only provide direct benefits in terms of time saving and convenience to the many people living in the rural areas, but will also help some of these areas to develop.
- Regional integration with neighbouring countries will lead to improved international trade as well as a boost to tourism. In Burma's case this is with China, Thailand, India and possibly Bangladesh.

One economic benefit of railways is to provide a route to ports or a navigable waterway, as happened in Europe in the mid 1800's.[28] In Burma, the first railway was built from Rangoon to Prome in 1877, giving access for passengers to ships plying the waters of the Irrawaddy River, especially vessels of the Irrawaddy Flotilla Company. Other important railheads were at the port of Bassein (modern-day Pathein) in the Irrawaddy Delta as well as at the port of Moulmein. Two smaller towns are Katha on the Irrawaddy River and Monywa on the Chindwin River. A small branch line runs from Naba on the main Mandalay-Myitkyina line to Katha on the Irrawaddy River.[29] Monywa is connected to Mandalay by rail (about 4.5 hours by train), and is the main port for boats heading up the Chindwin River to

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[27] Nevertheless, China has hopes of one day building a high-speed rail link from Ruili on the Chinese border to Muse, then to Yangon via Lashio and Mandalay, continuing on to Moulmein. See:

Khin Su Wai, (2016, December 5), "China eyes high speed railway as part of One Belt, One Road strategy", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/national-news/24040-china-eyes-high-speed-railway-as-part-of-one-belt-one-road-strategy.html.

[28] Wolmar, (2009), *op. cit.*, pp.102-103.

[29] Naba is on the main Mandalay-Myitkyina line, 16 miles west of Katha. There is a daily train departing from Naba for Katha at 7:00am. It leaves Katha in the aftenoon at 1:15pm to return to Naba. The trip takes about 1 hour 40 minutes each way. Naba is sometimes referred to as "Naba Junction".

towns such as Kalewa, Homalin or Khamti.[30] Looking ahead, the port of Sittwe may over the next few years find itself as a railhead. The complementing of railways and inland waterways services is discussed further in Chapter 3.

A comparison can be made between the construction of roads and railways and their respective impact on the economy.[31] Once a road is built, ongoing maintenance is fairy minimal, usually just entailing patching up when needed. Railways are quite different and employ a large workforce: not only to operate the trains, sell the tickets, service and maintain the rolling stock, operate the signals, *etc.* but also for tasks such as track inspection to ensure that the tracks are safe.[32]

An important issue to consider is the way in which spending is allocated to infrastructure. As the World Bank report highlights:[33]

> *Infrastructure investments have often been misallocated – too much to new investment, not enough to maintenance.*

In the context of Burma, this is exactly what is happening with the railways. The network, particularly the track, is in a run-down condition.[34] A greater portion of the National Budget of Burma needs to be allocated to the railways so that repair, proper maintenance and upgrading of the current system can occur. No example stands out more in my mind than the situation at Kalaymyo in Sagaing Division. The train line runs from Kalaymyo to Pakokku, but is blocked because of a major tunnel that has collapsed and has not been repaired. From the Kalaymyo end, trains can only run from Kalaymyo to Ye Myet Ni.[35] The line is isolated from the rest of Myanma Railways network, and it is probably for this reason that the rolling stock is very old. Kalaymyo needs to be linked to the rest of the Myanma Railways network, first by repairing the line to Pakokku and secondly by building a line to Monywa, which is linked to both Mandalay and Pakokku by rail. The Monywa-Kani-Mingin-Kalewa-Kalaymyo route was surveyed in 2011, but construction has

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[30] I travelled from Mandalay to Monywa by train on 14th December 2013, and by boat from Monywa to Homalin on 17th and 18th December 2013.

[31] Wolmar, (2009), *op. cit.*, p.251.

[32] In developed countries, a lot less staff are now employed selling tickets due to the introduction of smartcard ticketing systems.

[33] *World Bank*, (1994), *op. cit*., p.4.

[34] This will be highlighted in the two case studies in Chapters 5 and 6.

[35] This line is discussed in more detail in Chapter 5.

not started.[36] It is good publicity for the government to be introducing new air-conditioned trains on the suburban line in Yangon, but it is on lines such as the one from Pakokku to Kalaymyo where money desperately needs to be spent for repair and proper maintenance, or by constructing the Monywa-Kalaymyo line.[37] Either of these projects would see Kalaymyo linked to the rest of the rail network. Similar arguments could be put for proper maintenance and repairs to be carried on the Yangon-Moulmein-Ye-Dawei line or the Mandalay-Lashio line.

2.4 Cost-Benefit Analysis

One approach to the study of railways is a cost-benefit analysis. In 1965 Prest & Turvey conducted a survey over a variety of fields, including railways. They examined two recent railway projects in the United Kingdom, drawing on a study by Foster & Beesley published in 1963.[38] In looking at a new underground line in London, they concluded that the key benefits were:

- Saving time.
- Reducing costs.
- Extra comfort and convenience.

The key one among these was the saving of time. From the point of view of Burma, the upgrading of the existing Circular Railway in Yangon or the construction of a modern suburban railway (whether it be an underground railway or a Skytrain such as in Bangkok) would have the key benefit of saving time for people moving around the city, as the roads and streets in Yangon are becoming packed with traffic. Time would be saved both by the people who travel on the suburban railway and also by those on the roads in Yangon, as hopefully there would be less traffic on the roads. The Circular Railway is discussed in Chapter 8 of this thesis.

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[36] Kyaw Ye Min, (2011, April 26), *op. cit.*

[37] *The Global New Light of Myanmar*, (2015, July 6), "5th RBE train launched with air-conditioned coaches". Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-07-06-red.pdf.

[38] Prest, A.R. and R. Turvey, (1965, December), "Cost-Benefit Analysis: A Survey", The Economic Journal, Vol. 75, No. 300 (Dec., 1965), pp.683-735; and

Foster, C.D. and M.E. Beesley, (1963), "Estimating the Social Benefit of Constructing an Underground Railway in London", Journal of the Royal Statistical Society, Vol. 126, Part 1, 1963, pp.46-93.

Prest & Turvey also discussed the work of Ray & Crum from 1963, who examined proposals to close certain lines in the United Kingdom.[39] Ray & Crum concluded that the closure of rural lines would involve questions such as:

- Redundancies of specialist labour in out-of-the-way areas.
- Extra road maintenance.
- More road accidents.
- Longer journeys.

Keeping rural lines open therefore has an opposite effect. In the context of Burma, these points are very relevant, particularly the one relating to road accidents. The highway from Yangon to Mandalay Highway, which passes through the capital Nay Pyi Taw, has developed a reputation as a very dangerous road and is known as the "*Death Highway*".[40] The 366-mile highway was opened in early 2011 and is considered by many not to meet international design, construction or safety standards. The World Health Organization reported in 2009 that Burma had the second-highest road mortality rate in Southeast Asia, with Thailand being the worst.[41] The train trip from Yangon to Mandalay takes 14 to 15 hours if the train is running on time, much the same as when I travelled on the line in 1975.[42] It is not surprising that travellers, eager to reach Nay Pyi Taw or Mandalay in quicker time, take the more dangerous road route, for example travelling by bus. The journey from Yangon to Nay Pyi Taw by bus takes about five hours, compared to nine hours by rail.[43] An improvement in the time of travel by train between Yangon and Mandalay would hopefully see less traffic on the highway and a lower road toll.

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[39] Ray, G.F. and R.E. Crum, (1963, May), "Transport: Notes and Comments". National Economic Review, No. 24, May 1963, pp.23-41.

[40] Nyein Nyein, (2013, July 17), " 'Death Highway' at Center of Burma's Worsening Traffic Safety", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/burma/death-highway-at-center-of-burmas-worsening-traffic-safety.html; and

Nyein Nyein, (2014, May 15), "Riding the Death Highway", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/from-the-irrawaddy-archive-burma/riding-death-highway.html/nggallery/page/2.

[41] *AsiaSentinel*, (2011, March 10), "Burma's Highway of Death". Retrieved from: http://www.asiasentinel.com/society/burmas-highway-of-death/.

[42] *The Man in Seat 61* website, http://www.seat61.com/.

[43] *East Asian Bureau of Economic Research*, (2015, February), "Myanmar Trade and Investment Strategy". Retrieved from: http://www.eastasiaforum.org/wp-content/uploads/2015/02/Myanmar-Trade-and-Investment-Report-Full-low-res.pdf?ffd8a5&b862cd, p.139; and

For example, Train No. 11 Up departs Yangon at 6:00am and is scheduled to arrive in Nay Pyi Taw at 3:19pm and in Mandalay at 9:00pm. See:

The Man in Seat 61 website, *op. cit*.

2.5 The Government's Framework for Economic and Social Reform

In December 2012 the government published a report entitled "*Framework for Economic and Social Reform*", which was a ten-point framework covering areas ranging from health and education reform, agriculture, regulations on trade and investments, as well as presenting an infrastructure development programme.[44] The report set out policy priorities for the government for the period from 2012 to 2015. For the railways, the report stressed the following points:[45]

- An improvement of urban transport (an important part of which is the suburban railway in Yangon).
- Improvement of the quality of the railway sections connecting important economic centres, in particular the Yangon-Mandalay-Myitkyina line and the Bago-Moulmein line.[46]
- Upgrading of locomotives and coaches.

As discussed in Chapter 1, in late 2010 Myanma Railways published plans to build thirteen new railways in Burma. These were connecting parts of Burma to other key cities. The report refers to:[47]

> *the previous strategy of developing railroads that connect various parts of the country to economic centres.*

As shown in Table 4 in Chapter 1, railways were planned to be constructed as follows:

- In the south (Dawei to Myeik).
- On the west bank of the Irrawaddy River, from Pakokku to Kyangin.
- In Shan State linking Mong Nai (near the Shan State capital, Taunggyi), to Kengtung.
- A very ambitious line from Myitkyina in Kachin State to Namsang in Shan State.
- From Sittwe in Rakhine State to Minbu, on the Kyangin-Pakokku line.

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[44] *The Government of the Union of Myanmar*, (2012, December 14), "Framework for Economic and Social Reforms". Retrieved from: http://www.eaber.org/sites/default/files/FESR%20Official%20Version%20-%20Green%20Cover.pdf.

[45] *Ibid*., p.33.

[46] In travelling from Yangon to Moulmein, the line first heads north on the Yangon-Mandalay line to Bago, before heading east and then south to Moulmein. I have travelled twice from Yangon to Moulmein by rail. For a major line, the track from Bago to Moulmein is in quite poor condition.

[47] *The Government of the Union of Myanmar*, (2012, December 14), *op. cit*.

If these ever go ahead, they would contribute to keeping the Union of Burma together by linking key cities. Of these five railways:

- Construction of the Dawei-Myeik line has stopped. It was hoped that construction would resume in 2016, but this did not eventuate.[48]
- The line on the west bank of the Irrawaddy River from Pakokku to Kyangin has been constructed, but quite poorly, and only two of the four sections are operating.
- Construction of the Shan State Railway has been abandoned.
- Construction of the Myitkyina-Namsang line has been abandoned.
- Construction of the Sittwe-Ann-Minbu is starting up again after being suspended.[49]

The Kyangin-Pakokku line is the subject of Chapter 5 of this thesis and the railways in Shan State, including the so-called Shan State Railway, are discussed in Chapter 7. The strategy of using the railways to link other parts of Burma to key cities seems to be of lower priority given that construction of several of these lines has either been abandoned or greatly delayed. Myanma Railways' current strategy is to focus primarily on the Yangon-Mandalay line as well as the suburban line in Yangon.

The report also addresses the issue of building rail links to Kunming in China and Bangkok in Thailand (but interestingly, does not mention any rail link to India). The aim is to service these trade corridors by undertaking parallel development of road and rail networks. The report suggests that the Irrawaddy River could be used to transport tradable goods between Yunnan province and the deep-sea port of Thilawa near Yangon. The plan to use the inland water transport system in parallel with road and rail systems would be a great boon to China in giving Yunnan access to the seaports in the Indian Ocean. This plan for integration is a part of an attempt to improve co-operation between China and Burma. This integrated

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[48] *The Global New Light of Myanmar*, (2015, July 14), *op. cit*.

[49] *The Global New Light of Myanmar*, (2015, January 26), "RBE transport resumes in Sittway Township". Retrieved from: http://www.burmalibrary.org/docs20/GNLM2015-01-26-red.pdf; and

Ministry of Rail Transportation, (2015, November 23), *op. cit*.; and

RFA Burmese, (2015, January 23), "Reopening of Sittwe-Yechanbyin Railway Section", a video recording on YouTube. Retrieved from: https://www.youtube.com/watch?v=r3cc-cRgKuE.

"RFA" stands for "Radio Free Burma".

land and river transport system is similar to the "*Irrawaddy corridor*" proposed by Pan Qi in 1985, and was also discussed by Garver.[50]

2.6 A Comparison with Rail Infrastructure in Africa

The importance of infrastructure in Africa has been highlighted by three recent World Bank reports, examining area such as water supply, transport infrastructure, electricity supply and telecommunications. A comparison of rail infrastructure in Africa with Burma is valuable, given the poorly developed state of much of the continent of Africa. Key points relating to the railways from these three World Bank reports plus a report from the Sub-Sahara Africa Transport Policy Program are summarised below, together with comparison and comments relating to Burma.

2.6.1 World Bank Report - 2008

In a report published by the World Bank in 2008, Foster raised a number of points with respect to rail infrastructure:[51]

- *Railways provide a competitive edge on transporting bulk commodities, but in Africa the volume of traffic is below the minimum threshold needed to make the railway corridors financially viable. This is in part caused by the fact that freight tariffs are capped by competition such as road freight.* For Burma, the railways should have a competitive advantage in transporting bulk commodities such as rice and pulses, but for both the volume transported is too small. See Chapter 3 for a discussion of rice, and Chapter 8 for a discussion of pulses.
- *Governments need to create one-stop border posts to improve the efficiency of land frontier crossings.* For Burma, this will be very relevant for any proposed international lines, namely:
    - The China-Burma Railway with a border crossing at Muse (in Burma) and Ruili (in China).

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[50] Pan Qi, (1985, Szeptember 2), "Opening the southwest: an expert opinion", Beijing Review, 28:35, pp.22-23; and

Garver, (2001), *op. cit.*

[51] Foster, Vivien, (2008, September), "Africa Infrastructure Country Diagnostic. Overhauling the Engine of Growth: Infrastructure in Africa", World Bank. Retrieved from: http://siteresources.worldbank.org/EXTPRAL/Resources/africa_country_diagnostic.pdf.

- A line from Mandalay to India with the border crossing at Tamu (in Burma) and Moreh (in India).
- A line from Dawei in the south of Burma to Thailand.
- A line between Bangladesh and Burma, crossing the border at Gundam in Burma.

- *In Africa 40% of railway infrastructure is in need of rehabilitation.* In Burma, it is fair to say 100% of Myanma Railways' assets are in need of rehabilitation. The main line from Yangon to Mandalay line is being rehabilitated with Japanese funding.[52] Even new lines such as the Kyangin-Pakokku line are in need of repair, due to the poor standard of construction.
- *There is a need for institutional reform, with the transport subsectors lagging behind the telecommunications, power and water sectors.* In Burma, the government was allocating 5.1% of the 2011/2012 Budget towards the communications sector compared to just 3.3% for the railways, as was shown in Table 3 in Chapter 1. In the same Budget 16.2% was allocated to energy and 10.7% to electricity. Institutional reform is no doubt needed at Myanma Railways, but this issue is beyond the scope of this thesis.

2.6.2 World Bank Report - 2011

For the railways, the theme from the 2011 World Bank report is that the railways are not pulling their weight.[53] In Africa, the railways had transformed the face of Africa in the late 19th and early 20th centuries. The railways had a significant impact in Burma in the same period. The scene Gwilliam describes for Africa is very similar to Burma. He notes the following:[54]

> *Built to modest technical standards, railways were left unprepared to compete for time-sensitive traffic (including passengers) as road systems developed.*

Some interesting points that Gwilliam raises are:

- *The railways in Africa are generally undercapitalised, and were designed for relatively low axle loads and low speeds, and are ill-suited to modern*

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[52] *Railnews*, (2013, June 11), "Myanmar rail project feasibility study completed – Japan". Retrieved from: http://www.railnews.co.in/japan-completes-feasibility-study-of-myanmar-rail-project/.

[53] Gwilliam, Ken, (2011), "Africa's Transport Infrastructure: Mainsteaming Maintenance and Management", World Bank Publications, United States, pp.83-138.

[54] *Ibid*., p.83.

requirements. The same could be said for Burma. Mandalay is 388 miles by rail from Yangon, and the trip takes 14 hours, which is an average speed of just 27.7 miles per hour.[55] This is the main line in Burma. On the rural lines in Burma, travel is even slower. For example, the case study in Chapter 6 discusses a trip from Aungban to Loikaw: 102 miles in 11 hours, or an average of 9.3 miles per hour. Derailments in Burma are not uncommon due to the poor nature of the track.[56] There has been a growing number of derailments on the Mandalay to Myitkyina line.[57]

2.6.3 Report from the Sub-Sahara Africa Transport Policy Program - 2013

A report on the railway sector in Africa was published by the Sub-Sahara Africa Transport Policy Program (SSATP) in 2013.[58] SSATP is a partnership of 38 sub-Saharan countries and is affiliated with the World Bank. Some key points from this report, together with a comparison with Burma are:

- *Between 2001 and 2013 there was a 7% increase in freight transport, and a fall of 7% in passenger services.* By contrast for the same period both freight volume and passenger numbers in Burma fell: freight numbers were down by 20% and passenger numbers by 11%.[59]
- *Governments in Africa have responded to the competition from road transport by granting concessions for the railways. More than 70% of*

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[55] *The Man in Seat 61* website, *op. cit*.

The fastest service is the No. 5 Up train which departs Yangon at 3:00pm and is scheduled to arrive at Mandalay at 5:00am. One of the new Chinese trains is now used for this service.

[56] I was on a train that derailed between Hsipaw and Lashio in 2011. See:

Stubbs, Lindsay C., (2012, April 21), "Derailed in Shan State". Unpublished manuscript, Macquarie University; and

Garver, (2001), *op. cit.*, pp.266-270.

[57] Maung Chit Lin, (2016, January 10), "Cargo train derails on Myitkyina-Mandalay Route causing delays", The Global New Light of Myanmar. Retrieved from:; http://www.burmalibrary.org/docs21/GNLM2016-01-10-red.pdf; and

Aung Thant Khaing, (2016, September 25), "Myitkyina-bound train derails, two drivers injured", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs23/GNLM2016-09-25-red.pdf; and

Maung Chit Lin, (2016, September 28), "Train derailment injures one", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs23/GNLM2016-09-28-red.pdf.

[58] Olievschi, Vasile Nicolae, (2013, March), "Rail transport. Framework for Improving Railway Sector Performance in Sub-Saharan Africa", SSATP Africa Transport Policy Program. Retrieved from: http://www.ssatp.org/sites/ssatp/files/publications/SSATPWP94-Railway-Performance.pdf.

[59] Freight volumes fell from 3.55 million tons in 2001 to 2.84 million tons by 2013; passenger numbers fell from 60.5 million in 2001, to 53.8 million by 2013.

railway activity in sub-Saharan Africa (excluding South Africa) are managed by private companies. In Burma, this has not happened in any meaningful way yet, but is possible in the future. An example of a small concession is a joint venture that was formed in late 2014 between Myanma Railways and Kachin Public Co Ltd to operate two passenger trains with better conditions (e.g. only reserved seats) and better service between Mandalay and Myitkyina.[60]

- *Railway infrastructure in sub-Saharan Africa is inadequate, with major issues being: (i) Ageing track (e.g. insufficient ballast); (ii) poor condition of most structures; and (iii) obsolete signalling and telecommunications.* The same can be said for Burma. Track condition is quite poor on many parts of the network, and often there is inadequate ballast. Structures, for example railway stations, are frequently in very poor condition. On the telecommunications front, Myanma Railways has issued a tender to install an optical fibre cable network along the railway lines, thus linking the stations.[61] This is discussed further in Chapter 8.
- *Low traffic volumes are making the railways non-competitive.* As is shown in Chapter 3, freight volumes in Burma have been in steady decline since 2001 (dropping 36% from 2001 to 2015); and passenger numbers have been falling since 2008, dropping by 37% in the seven years from 2008 to 2015.

2.6.4 World Bank Report - 2014

A World Bank report published in 2014 asserts that inadequate infrastructure in Africa is holding back economic growth by two percentage points per annum.[62] Some of the issues are similar to the ones raised in the 2008 World Bank report

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[60] *The Economist*, (2015, January 3), "Eager mindsets". Retrieved from: http://www.economist.com/news/asia/21637448-kachins-are-grabbing-opportunities-change-reluctant-government-eager-mindsets; and

The Global New Light of Myanmar, (2014, December 28), "Myitsone-Mandalar Express down-train launched maiden trip from Myitkyina, Kachin State on 22 December". Retrieved from: http://www.burmalibrary.org/docs20/GNLM2014-12-28-red.pdf.

[61] *Myanma Railways*, (2015, February 18), "Invitation to Expression of Interest from Consulting Firms for Optical Fiber Cable Project", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-02-18-red.pdf.

[62] Foster, Vivien and Cecilia Briceño-Garmendia (eds.), (2014), "Africa's Infrastructure: A Time for Transformation", World Bank, New York, p.2.

discussed earlier, and so will not be repeated here. Some other key points made are:

- *African railways generate much more revenue from transporting freight than from transporting passengers*. The opposite is true in Burma.
- *Passenger business is steadily shrinking*. As will be shown in Chapter 3 of this thesis, passenger numbers are also falling in Burma.
- *Few railways outside South Africa are essential to the functioning of the economy (lines other than dedicated mineral lines).*[63] Burma does not have the mineral wealth of Africa, so no comparison can be made at that level. However, in Burma the railways are an important part of the economy, especially for the transport of people.
- *Many of the lines in Africa are isolated from other lines, which is not surprising that the railways are operating in 32 different countries.*[64] In Burma, the lines are not isolated, except for the lines at Kalaymyo, Taunggyi and a small line at Sittwe.[65]
- *In Africa there have been continental railway plans for over a century, but most of the African countries with railways remain disconnected from other countries.*[66] Burma is also disconnected, but there are plans to build links to China, India, Thailand and perhaps Bangladesh one day. The plans for a line from Burma to China go back over a century, a similar time frame to the plans for lines in Africa.

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[63] *Ibid*., p.229.

[64] *Ibid*., p.230.

[65] These two lines are discussed in Chapter 5 of this thesis. For Sittwe, see: *The Global New Light of Myanmar*, (2015, January 26), *op. cit*.

[66] Foster and Briceño-Garmendia, (2014), *op. cit.,* p.230.

- *Traffic density, which is defined as the sum of the passenger-miles and ton-miles divided by the route length, is generally low in Africa, being generally less than 1 million, and for some countries being as low as 300,000.*[67] In Burma, traffic density averaged 1.14 million for the years 2001-2005, but fell to 692,000 by 2015. The traffic density for the years 2001-2015 is shown in Figure 3.[68]

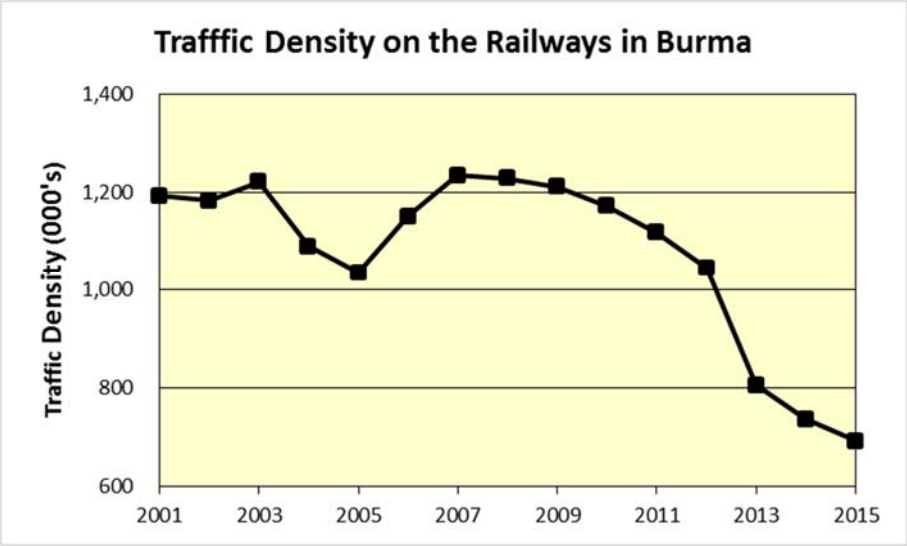

Figure 3: Traffic density on the railways in Burma.

Traffic density for Burma is higher than for most African countries. The difference is that for Africa the bulk of the contribution comes from freight rather than passengers. For Burma it is the opposite, as can be seen in Table 7.

[67] *Ibid.*, p. 231-232 and p.246.

See in particular Figure 11.3 on p.232 which shows an average railway network traffic density for 2001-05.

[68] The data for this graph come from the Statistical Yearbooks published by the Central Statistical Organization.

Year	Passenger Miles (Billions)	Freight Ton Miles (Billions)	Total (Billions)	Route Length (Miles)	Traffic Density (000's)
2001	2.76	0.75	3.51	2,946	1,193
2002	2.80	0.72	3.52	2,974	1,183
2003	2.93	0.72	3.65	2,989	1,221
2004	2.68	0.60	3.28	3,012	1,088
2005	2.60	0.54	3.15	3,042	1,035
2006	2.97	0.57	3.54	3,075	1,151
2007	3.30	0.55	3.85	3,119	1,234
2008	3.38	0.54	3.91	3,187	1,228
2009	3.35	0.57	3.92	3,238	1,211
2010	3.34	0.66	4.00	3,410	1,172
2011	3.33	0.70	4.03	3,605	1,117
2012	3.09	0.72	3.81	3,653	1,044
2013	2.37	0.60	2.97	3,688	805
2014	2.23	0.52	2.74	3,722	737
2015	2.12	0.50	2.63	3,795	692

Table 7: Traffic density for the railways in Burma.

An extensive statistical overview of the railways in Burma is the topic of Chapter 3 of this thesis, including an examination of passenger density and freight density.

2.7 Railways and Their Role in Developing Empire

The above discussion has focused on the economic impact and benefit of railways, as well as the economic history of railway development. One can more specifically consider the impact of railways in helping to develop empires, both from an economic and political perspective. Charney has addressed this issue from a historical, economic and political viewpoint.[69] Charney considers that railways were vitally important in establishing and developing empires around the world during the colonial period in the late 19th century and early 20th century. The railways were one of the main mechanisms for moving people and resources around colonies as well as out of colonies. The railways had a key economic role in the colonies, especially in aiding the export of raw materials and cash crops by transporting them to the ports, from where they went by sea to the colonial motherland. In Burma, the largest crop item carried was of course rice, but mining

[69] Charney, Michael W., (2016), "Railways and empire", in MacKenzie, John M. (ed.), "The Enclycopedia of Empire", Wiley Blackwell, New York, pp.1722-1727.

outputs such as zinc and lead from the Bawdwin Mines in Shan State were also transported. This role of the railways transporting mineral output could be revived in Burma. In 2015 the Lashio Zinc Refinery in Shan State began operations, and there is the potential for the nearby Bawdwin Mines and the Namtu smelter slag dumps to supply long-term feedstock to this refinery. This is a part of a proposal by an Australian company, Top End Minerals Ltd, to expand mining operations at the Bawdwin Mines site.[70] There should be a role here for the railways, with the possibility of upgrading the narrow-gauge line from Namyao to Namtu and the Bawdwin Mines.[71]

In colonial times, the railways were also important for administration, with the British having an extensive colonial administration system in place. Similarly, the railways enabled news and ideas to be disseminated more easily throughout the country, which helped bring the nation closer together and contributed to the growth of nationalism. It could be argued that this was the case in Burma, but certainly not to the extent that it contributed to nation building in Canada, as discussed in §2.2 above.

The railways in Burma have also played a role in shaping the political direction of the country. The famous travel writer Norman Lewis in his classic work, "*Golden Earth. Travels in Burma*", described the attacks on the trains in the late 1940's and early 1950's while he was travelling in Burma. This was a component of the instability in the country in the 1950's.[72] Similarly in the early 1960's attacks on the railways occurred in the lead-up to the coup-d'état by General Ne Win in March 1962. For example, 1960 and1961 saw incidents such as the firing on passenger

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[70] *Top End Minerals Ltd*, (2017, May/June), "Unlocking the value from one of Asia's largest underdeveloped multi-commodity assets". An investor presentation. Retrieved from: http://www.topendminerals.com/resources/i/170510---Top-End-Minerals---Investor-presentation_sdirV2-_-CJ-Update_NR..pdf; and

Top End Minerals Ltd, (2017, May 24), "Top End Minerals announces proposed investment in the Bawdwin Zn-Pb-Ag-Cu mine in Myanmar". An announcement to the Australian Securities Exchange. Retrieved from: http://www.topendminerals.com/resources/i/Bawdwin-announcement-final_24may17.pdf.

[71] Kyaw Hsu Mon, (2016, November 26). "Australian Mining firm Shares Jump After Shan State Deal", The Irrawaddy. Retrieved from: http://www.irrawaddy.com/business/the-irrawaddy-business-roundup-november-26.html; and

Top End Minerals Ltd, (2016, November 25), "Top End Minerals Announces Proposed Acquisition of High Grade Long Keng Zinc Mine and Lashio Zinc Refinery in Myanmar". An announcement to the Australian Securities Exchange. Retrieved from: http://www.asx.com.au/asxpdf/20161125/pdf/43d6bhkpt99c6r.pdf..

[72] Lewis, Norman, (1952), "Golden Earth. Travels in Burma", Jonathan Cape, London, pp.227-239.

trains and the mining and derailing of trains. The worst incident occurred in early 1961 and was described as follows:[73]

> *The attacks reached a climax in the mining of the 4 Down Express in the early hours of the morning of March 26, 1961, at a spot between Tawgywe-In and Kanyutkwin. The derailment was followed by a massacre of passengers by the insurgents, who mowed them down with rifle and automatic fire, before bayoneting some of the wounded and dying. The total casualties was 18 killed and 40 injured and wounded.*

Incidents such as this would have been used to justify the subsequent coup.

2.8 Railway Finance

The economic benefits of railways are quite clear, but the obvious question is "*can governments afford them?*" The most common way of examining a railway's level of profitability is the Operating Ratio. This metric is defined as the operating expenses divided by the operating revenue,

$$Operating\ Ratio\ =\ \frac{Operating\ expenses}{Operating\ revenue}\ .$$

It gives an indication of the ability of management: whether management is good at controlling expenses but also good at increasing revenue.[74] The expenses in the ratio do not include interest or tax. A lower figure of Operating Ratio is regarded as better. The ratio is used as an indicator of the financial health of a railway. The Operating Ratios of modern railways are in the range 75% to 100%, with a figure of 80% or lower considered desirable.[75]

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[73] U Sett Kaing, (1961), "Burma Railways", Overseas Railways, 1961. Published by Railway Gazette Publications, pp.7-9.

This incident occurred on the Rangoon-Mandalay line. Subsequently changes were made to the timetable to avoid travel at night time on the Toungoo-Pyuntaza section of this line.

Also see:

Bixler, Norma (1967), "Burmese Journey", The Antioch Press, Ohio, pp.70-71.

Bixler and her family lived in Burma from 1958 to 1960. She notes that trains only ran in the daytime because sometimes at night insurgents attacked trains and the bridges they crossed.

[74] Indian Railways wants to do away with using the Operating Ratio as a measure of financial performance, and has formed a committee and engaged an international consultancy firm to create a new performance index. See:

Dastidar, Avishek G., (2017, April 19), "At 96.9 per cent, Railways posts worst operating ratio in 16 years last fiscal", Indian Express. Retrieved from: http://indianexpress.com/article/india/railways-posts-worst-operating-ratio-in-16-years-last-fiscal-4618682/.

[75] *Asian Development Bank,* (2016), "Myanmar Transport Sector Policy Note. Railways", p.24. Retrieved from: https://www.adb.org/sites/default/files/publication/189081/mya-railways.pdf; and

Sood, Jyotika and Utpal Bhaskar, (2017, February 16), "Railways' operating ratio touches a record 109% in April-December", Livemint. Retrieved from:

It is instructive to look at India and the importance that Indian Railways places on the Operating Ratio. India has the largest railway network in the world, and the Operating Ratio features frequently in press releases by Indian Railways and in newspaper articles. The Operating Ratio for Indian Railways for the financial years ended 31st March 2001 to 2017 is shown in Figure 4 below.[76]

http://www.livemint.com/Politics/pP70AXtpAMAHqsoxyFaFtL/Railways-operating-ratio-touches-a-record-109-in-AprilDec.html.

[76] The data for this graph come from several sources:

For 2001 and 2002 see:

Dastidar, (2017, April 19), *op. cit.*

For 2004-2012 see:

The Economic Times, (2017, January 25), "Indian Railways' Operating Ratio (%)". Retrieved from: http://economictimes.indiatimes.com/economy-dashboard/indian-railways-operating-ratio-/articleshow/56736893.cms.

For 2013-2015 see:

Government of India [Ministry of Railways], (2015, July 30), "Indian Railways Improves its Operating Ratio (O.R.). This is the first Time in the Last Seven Years That O.R. has Surpassed/Improved the Budgeted Target in a Year". Retrieved from: http://pib.nic.in/newsite/PrintRelease.aspx?relid=123926; and

Government of India [Ministry of Railways], (2015, December 9), "Measures Taken By Railways To Optimize Operating Ratio. Railways Measures Towards Technology Upgradation and Development Rail Transport In The country". Retrieved from: http://pib.nic.in/newsite/PrintRelease.aspx?relid=132866.

For 2016 see:

Sood and Bhaskar, (2017, February 16), *op. cit.*

For 2017 see:

Kumar, Saurabh, (2017, April 26), "In big boost for Indian Railways, 10 of 17 rail zones make profits", Financial Express. Retrieved from: http://www.financialexpress.com/industry/in-big-boost-for-indian-railways-10-of-17-rail-zones-make-profits/642443/.

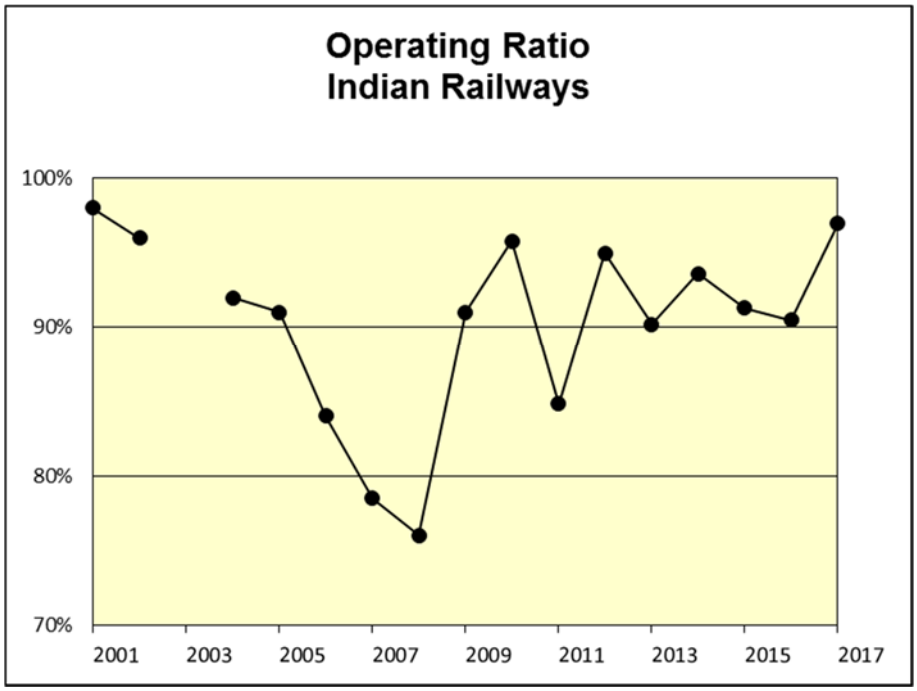

Figure 4: The Operating Ratio for Indian Railways.

In the 1960's and 1970's the Operating Ratio was not a problem for Indian Railways, with the best figure of 74.7% being achieved in the 1964 financial year.[77] But as the graph above shows, since 2012 it has been in the range 90% to 97%. At one stage during the 2017 financial year, it looked like the Operating Ratio for the year would be greater than 100%, but it finished at 97% which was the worst figure for sixteen years.[78] A figure of 94.6% is forecast for the 2018 financial year.[79] What is apparent from India, and indeed other countries, is that the passenger segment is heavily subsidised by the freight operations.[80] For example for the 2017 financial year, ten of the seventeen zones Indian Railways operates were profitable. The other seven had heavy passenger traffic and were running at a loss. Passenger operations require a much larger number of staff to run the operations, and this is the main reason for the poor Operating Ratios.[81] Around the world, passenger business is subsidised by freight operations.

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[77] *General Knowledge Today*, (2015, November 15), "Operating Ratio in Indian Railways". Retrieved from: http://www.gktoday.in/blog/operating-ratio-in-indian-railways/.

[78] Dastidar, (2017, April 19), *op. cit*.

[79] Sood and Bhaskar, (2017, February 16), *op. cit*.

[80] Kumar, (2017, April 26), *op. cit*.

[81] *Ibid*.

Turning to Myanma Railways, the figures are much worse than for Indian Railways. Figures for the financial years 2009 to 2012 are shown in Table 8 below.[82] The values for 2013 were provisional and should be treated with caution.

Year ended 31st March	2009 (Kyat millions)	2010 (Kyat millions)	2011 (Kyat millions)	2012 (Kyat millions)	2013 (Kyat millions) *[Provisional]*
Revenue					
- Passenger	20,541	20,204	20,639	29,460	36,205
- Goods	5,469	7,690	8,288	16,735	19,623
- Other	2,104	2,211	4,237	4,804	5,826
Total revenue	**28,114**	**30,105**	**33,165**	**50,999**	**61,655**
Expenses					
- Operating expenses	52,601	58,865	66,347	71,535	78,059
- Interest	27	37	62	13	4,218
- Profit & Loss on foreign exchange	(9)	(5)	(25)	(2)	
Total expenses	**52,618**	**58,896**	**66,383**	**71,546**	**82,276**
Operating ratio	**187%**	**196%**	**200%**	**140%**	**127%**

Table 8: Revenue, expenses and the Operating Ratio for Myanma Railways, 2009-2013.

In the 2014 financial year, Myanma Railways reported an Operating Ratio of 169%.[83] These figures are clearly much worse than what Indian Railways is achieving. As Table 8 above shows, the bulk of the revenue for Myanma Railways is coming from the passenger segment rather than freight, and this has had an adverse effect on the Operating Ratio.

The Asian Development Bank has considered several scenarios for Myanma Railways' future. They are:

1. **Business-as-Usual Scenario**. No improvement in quality of service; existing assets deteriorate; market share of Myanma Railways falls. Operating losses increase with the Operating Ratio approaching 200%.
2. **Extensive Growth Scenario**. Huge capital investment by government, high passenger numbers, and freight is marginal. Large operating losses, with the Operating Ratio approaching 300%.

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[82] *Myanma Railways*, (*circa* 2012), "Challenges and Opportunities in the Railway Subsector in Myanmar". Retrieved from: http://www.myanmarailways1877.com/sites/default/files/page_pdf/Challenges%20and%20Opportunities%20in%20the%20Railway%20subsector%20in%20Myanmar_0.pdf.

[83] *Asian Development Bank,* (2016), "Myanmar Transport Sector Policy Note. Railways", *op. cit*., p.36.

3. **Revival Scenario**. Rationalisation, upgrade and replace existing assets, passenger volumes increase on Yangon-Mandalay line, increased revenue. Operating Ratio of 90-100%.

The Asian Development Bank is recommending the Revival Scenario. The impact on the Operating Ratio for the three scenarios is shown in Table 9 below:[84]

Service	Current	Business-as-Usual Scenario	Revival Scenario [Phase 1 & 2]	Revival Scenario [Phase 3]	Extensive Growth Scenario
Operating ratio					
Freight	1.11	1.54	0.85	0.80	1.74
Passenger	1.78	2.32	1.35	1.07	2.92
Freight and Passenger combined	1.76	2.27	1.32	1.05	2.84
Profitability					
Net Annual Profit/(Loss) [Kyat Billions]	**(31.9)**	**(51.0)**	**(9.5)**	**0.9**	**(76.7)**

Table 9: Projected Operating Ratio and profitability for Myanma Railways.

As can be seen in this table, the passenger business has a much worse Operating Ratio than the freight business.[85]

The government of Burma faces a difficult decision: to what extent should the operations of Myanma Railways be subsidised? The figures for the Operating Ratio in Table 9 above paint an ugly picture, with the only reasonable figures being under the Revival Scenario. There is pressure on Myanma Railways already to go down the Revival Scenario route, as is evidenced by the concentration on improving the Yangon-Mandalay line and also the Circular Railway in Yangon. Freight will play an important role on the Yangon-Mandalay line and this should improve the Operating Ratio. But this focus is seeing small rural services closed and a lack of expenditure on these rural branch lines. Longer-term it is not viable to have an Operating Ratio of 1.76 which the Asian Development Bank has estimated the current situation to be. But it is also equally not feasible to try to achieve an Operating Ratio of 1.05 such as the Asian Development Bank is suggesting. Later chapters in this thesis will comment on the poor quality of track, rolling stock and stations, with particular discussion of the line on the west bank of the Irrawaddy River from Pakokku to Kyangin; the line from Aungban to Loikaw; and the railways in Shan State. From a political point of view, the new NLD

[84] The Operating Ratio is expressed as a number in this table rather than as a percentage.

[85] For the Current Scenario, the ADB model results differ slightly from the Operating Ratio that Myanma Railways reported for the 2014 financial year: 1.73 for the ADB model; 1.69 reported by Myanma Railways.

government should not let these particular lines deteriorate any further, and indeed I am advocating that improvement, in some cases significant improvement, is needed. But at what cost? It is beyond the scope of this thesis to go down that philosophical route, but suffice it to say the country would be much better off with a significantly improved and more efficient rail network. The obvious answer is to spend less money on the military and divert to funds to key areas such as health, education and infrastructure development, including the railways. What Myanma Railways can do itself is to significantly improve its freight operations, especially on the main Yangon-Mandalay line, as well as the Yangon-Moulmein and Mandalay-Myitkyina lines to lessen the subsidy needed from the government for unprofitable passenger services.

2.9 Conclusion

This chapter has examined the economic benefits and impact of railways, which are manifold. However, the new NLD government is in a difficult position: it has a limited Budget with the areas of health and education in urgent need of funding; and a military that is taking up too much of the Budget's funds but presents a threat to the democratically elected government. Against this Myanma Railways must compete with roads and to a lesser extent the inland waterways for funding by the government. The benefits of railways are numerous, but the management of Myanma Railways is under pressure to rein in costs and bring the Operating Ratio down to a reasonable level. The economic benefits of rail are wide and varied, and around the world there is a move by governments to put funding into railways. But the dilemma for the NLD government, and indeed previous governments in Burma, is how much should the railways be subsidised to achieve some of these benefits? There is no easy answer to that question.

Chapter 3

STATISTICAL OVERVIEW OF THE RAILWAYS IN BURMA

3.1 Sources of Information on the Railways

Statistical data on the railways in Burma are available from various sources, with the main sources being:

- The Statistical Yearbook published by the government.[1] For example, the *Statistical Yearbook 2015* has data for the period 1995/96 to 2014/15.[2] Data are not given for every year however.
- Reports to the Pyithu Hluttaw on the financial, economic and social conditions in Burma.
- *Economic Survey of Burma*, for the years 1951-1964.
- *Selected Monthly Economic Indicators,* published by the Central Statistical Organization (CSO), a part of the Ministry of Planning and Finance.[3]
- *Administration Report on the Railways in India* and *Report to the Secretary of State of India.*[4]

Special mention should be made of the work of J.S. Furnivall, who compiled many statistics in his *A Study of the Social and Economic History of Burma (British Burma).*[5] J.S. Furnivall (1878-1960) was a British-born colonial public servant and

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[1] The Central Statistical Organization (CSO), a part of the Ministry of Planning and Finance, is now responsible for publishing the Statistical Yearbooks, as well as the monthly publication, *Selected Monthly Economic Indicators*.

[2] *The Government of the Republic of the Union of Myanmar*, (2015, December), "Myanmar Statistical Yearbook 2015", Central Statistical Organization, Ministry of National Planning and Economic Development, Nay Pyi Taw.

[3] The publication *Selected Monthly Economic Indicators* is particularly valuable in providing the most current information.

[4] Burma was administered from India until 1936. These reports give statistical data on the railways in Burma from 1877 to the early 1900's. See, for example,

Stanton, F.S., (1885), "Administration Report on the Railways in India for 1884-85", Her Majesty's Stationery Office, London; and

Danvers, Juland, (1878), "Report to the Secretary of State of India in Council on Railways in India for the year 1877", Her Majesty's Stationery Office, London.

[5] Furnivall, J.S., (undated), "A study of the social and economic history of Burma (British Burma), statistical appendix." The Economic and Social Board, Office of the Prime Minister, Rangoon. This is an undated typescript cited in:

Saito, Teruko and Lee Kin Kiong, (1999), "Statistics on the Burmese Economy. The 19th and 20th Centuries", Institute of Southeast Asian Studies, Singapore, p.3.

writer who lived in Burma from 1902 to 1931, and after Independence from 1948 to 1960 when he was appointed as an adviser in U Nu's administration.[6] This work is difficult to access, but fortunately Saito & Kiong have drawn on Furnivall's statistical data and for the railways have provided data from 1879 to 1942.

From 1974/75 onwards the data in the graphs in this thesis are for the fiscal years ended 31st March.[7] For example, the year ended 31st March 1981 (referred to in the yearbook as "1980/81") is shown as 1981, *etc*. The accuracy of the statistics can be questioned. For example, one set of data examined in this chapter is the level of paddy rice production in Burma. The data in the *Statistical Yearbook 2011* claimed a level of paddy production of 32 million tons in 2011. This figure was challenged by the US Department of Agriculture who claimed that the Government of Myanmar was significantly overstating the figure for political purposes.[8] Whether the data are overstated or not, the figures can be used as a proxy and are valuable in showing trends in the various sets of data.

3.2 Passenger Numbers

The graph in Figure 5 shows passenger numbers for the period 1930 to 2015.[9]

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[6] *Wikipedia* website, "John Sydenham Furnivall". Retrieved from: https://en.wikipedia.org/wiki/John_Sydenham_Furnivall.

[7] Beginning 1974/75 the fiscal year covers 1st April to 31st March; prior to that it covers 1st October to 30th September. See:

The Government of the Union of Burma, (1984), "Report to the Pyithu Hluttaw on the Financial, Economic and Social Conditions of the Socialist Republic of the Union of Burma for 1984/85." The Ministry of Planning and Finance, Rangoon, p.xxiii.

[8] *Oryza*, (2013, February 14), "Burma Rice Production Figures Highly Exaggerated, Says USDA". Retrieved from: http://oryza.com/content/oryza-exclusive-burma-rice-production-figures-highly-exaggerated-says-usda.

Oryza.com is an online site that provides a daily rice market newsletter, market prices and country reports.

[9] The data in most of the graphs in this thesis are from multiple sources. For example, the *Economic Survey of Burma* covers the years 1951 to 1964; the *Report to the Pyithu Hluttaw on the Financial, Economic and Social Conditions of the Socialist Republic of the Union of Burma* was published from 1979 to 1989; its successor the *Review of the Financial, Economic and Social Conditions* was published from 1990 to 1998; and the *Statistical Yearbook* is available for various years from 1961 to the current day, with the latest one published being for 2016. As these are all published by government sources, there is some degree of consistency in the data.

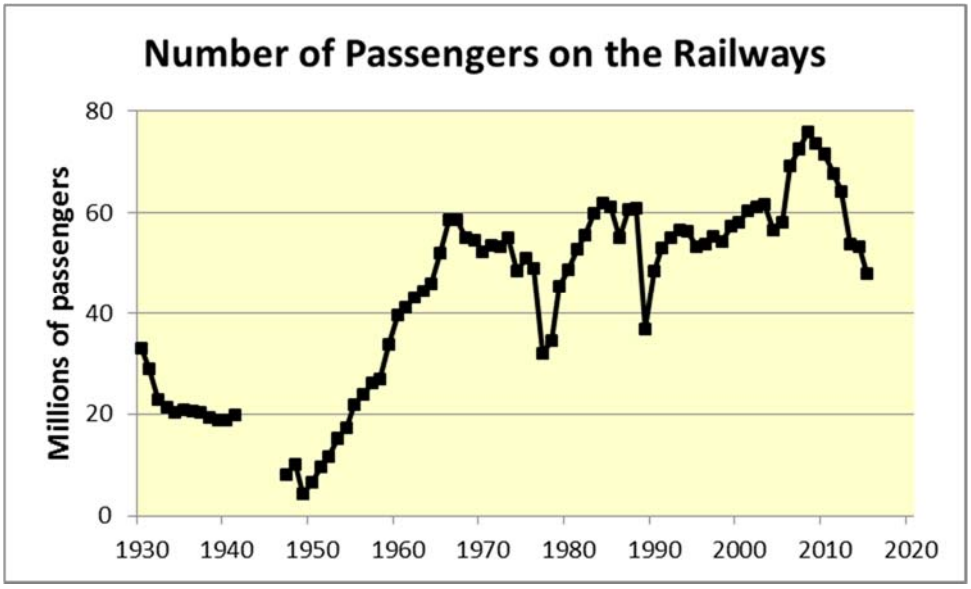

Figure 5: The number of passengers travelling on the railways in Burma.

The trends in the passenger numbers are interesting, reflecting the recent history of the country. In the period from before World War II until the few years after it when there was insurgency activity in the newly independent Burma, there was steady decline, with passenger numbers falling from 33 million in 1930 to just 6.6 million by 1950. Then followed a period of strong growth as the insurgency activity was quelled, and even after the coup in 1962 growth continued until 1966, peaking at 58.7 million. But the effects of Ne Win and his successor's economic policies began to bite, with passenger numbers being quite volatile but with no overall growth between 1966 and 2005, when passenger numbers were 58.2 million. Passenger numbers peaked at 76.0 million in 2008, but fell away to 47.9 million by 2015, a fall of 37% (or 6.4% p.a.) over these seven years.[10] One thing noticeable in the graph is the sharp drop in the 1988/89 year, when passenger numbers fell from 61 million to just 37 million. This would have been due to the severe political upheaval in Burma in 1988. The effects of World War II are also clearly visible, when much rolling stock was destroyed and most of the track was badly damaged.[11] A key point to note with the passenger data is that nearly 60% of passenger numbers are now from suburban traffic, i.e. in Yangon on the Circular

[10] As will be seen later in this chapter, passenger numbers on the inland waterways have been falling quite sharply since 2011.

[11] Cook, B.C.A., (1957), "Economic and Commercial Conditions in Burma". Published for the Board of Trade, Commercial Relations and Exports Department, by Her Majesty's Stationery Office, London, pp.19-20.

Railway.[12] This is shown in Figure 6, where it can be seen that both suburban and main-line traffic numbers were falling between 2008 and 2014. The main-line figures have fallen by 41% for the six years from 2008 to 2014; the suburban ones by 21%; with a 30% fall overall.

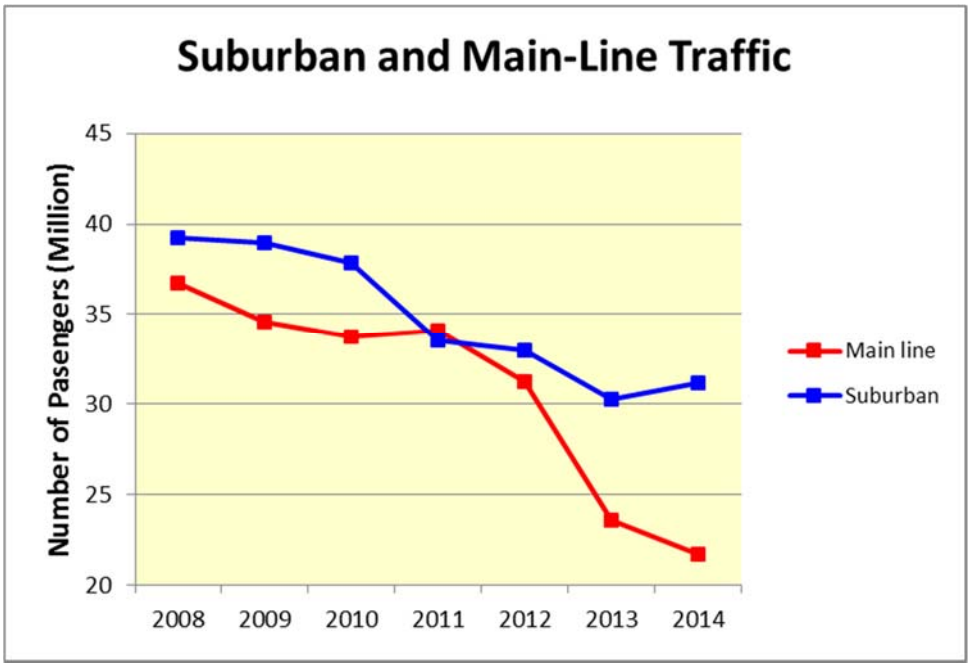

Figure 6: Suburban and main-line traffic, 2008-2014.

It is important to note that even though suburban traffic and main-line traffic were about equal in numbers (until 2012), the main-line traffic probably accounts for about 90% of the revenue.[13] This conclusion is based on data from the late 1950's when, like now, suburban traffic was approximately equal in size to main-line traffic, but the main-line traffic provided 93-95% of revenue.[14]

The sharp decline since 2008 in passenger numbers on the main lines is surprising. This may be due to improving alternative transport, such as more modern buses; the new highway from Yangon to Mandalay; and greater ownership

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[12] *Ministry of Rail Transportation*, (2014, October 13-15), "Country Report (Myanmar)". Presented at the UNESCAP Regional Meeting on Cooperation for Facilitation of International Railway Transport held in Bangkok, 13-15 October 2014. Retrieved from: http://www.unescap.org/sites/default/files/Myanmar_2.pdf; and

Ministry of Rail Transportation, (2013, February 1), "Brief Presentation". Retrieved from: http://www.advantageaustria.org/mm/events/MR.pdf.

[13] The split in passenger numbers as at March 2014 was 41% for main-line traffic and 59% for suburban traffic.

[14] Cook, (1957), *op. cit.*, p.20.

of cars, especially in Yangon. Data on the registration of passenger vehicles are shown in Figure 7 below.[15]

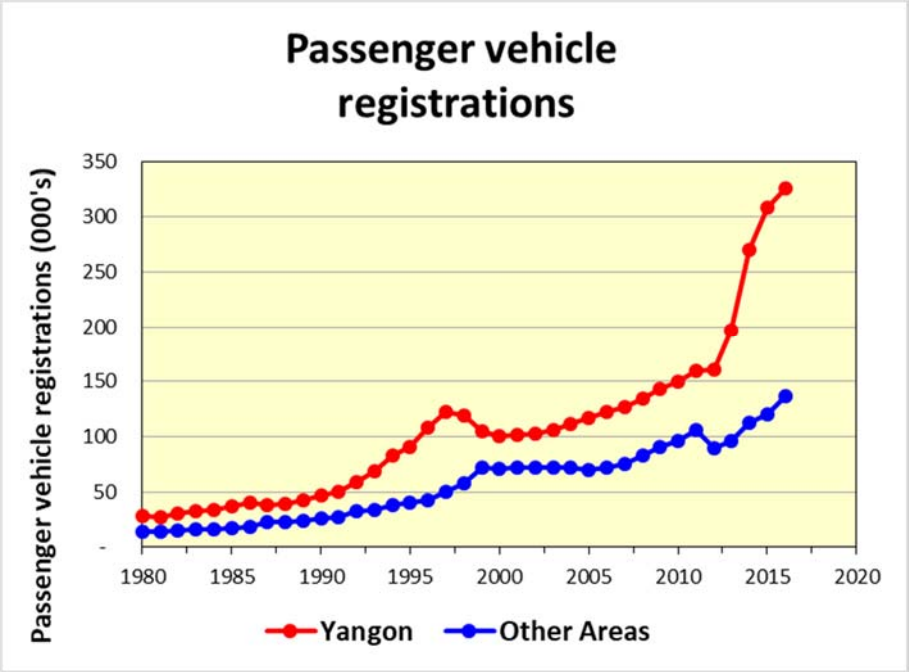

Figure 7: Passenger vehicle registrations

The strong rise in passenger vehicle registrations in Yangon from 2012 onwards is apparent. Passenger vehicle registrations in Yangon rose from 160,290 in 2012 to 325,963 by 2016, which is an increase of 103% or 19.4% p.a.[16] This would have caused a drop in the number of passengers using the Circular Railway in Yangon.[17] Outside of Yangon, passenger vehicle registrations rose from 89,271 in 2012 to 136,236 by 2016, an increase of 53% or 11.1% p.a.[18]

There are many more new buses on the roads in Yangon and in the regional areas. An example of the type of new buses travelling on the highways in Burma is shown in Plate 1 below.

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[15] A vehicle that can accommodate a maximum of eight passengers is classified as a passenger vehicle. See:

The Government of the Union of Myanmar, (1997, August), "Statistical Yearbook 1997", Central Statistical Organization, Ministry of National Planning and Economic Development, Yangon, p.259.

[16] I acknowledge the advice of one of the examiners of this thesis to examine data on car registrations. This graph includes figures from the 2016 *Statistical Yearbook*. See:

The Government of the Republic of the Union of Myanmar, (2016, December), "Myanmar Statistical Yearbook 2016", Central Statistical Organization, Ministry of National Planning and Economic Development, Nay Pyi Taw.

[17] Clearly not all cars or buses registered in Yangon are only driven in Yangon, but nevertheless the conclusion is reasonable.

[18] For the year ended 31st March 2011 passenger vehicle registrations in areas outside Yangon were 105,788. If calculations are done for the 2011-2016 period instead of 2012-2016, the increase is 29% or 5.2% p.a.

Plate 1: An example of one of the new buses in use on the highways in Burma.

This was a Yangon-registered bus on the road between Myawaddy and Yangon.[19] Bus registrations have also risen sharply since 2012, as can be seen in Figure 8 below.

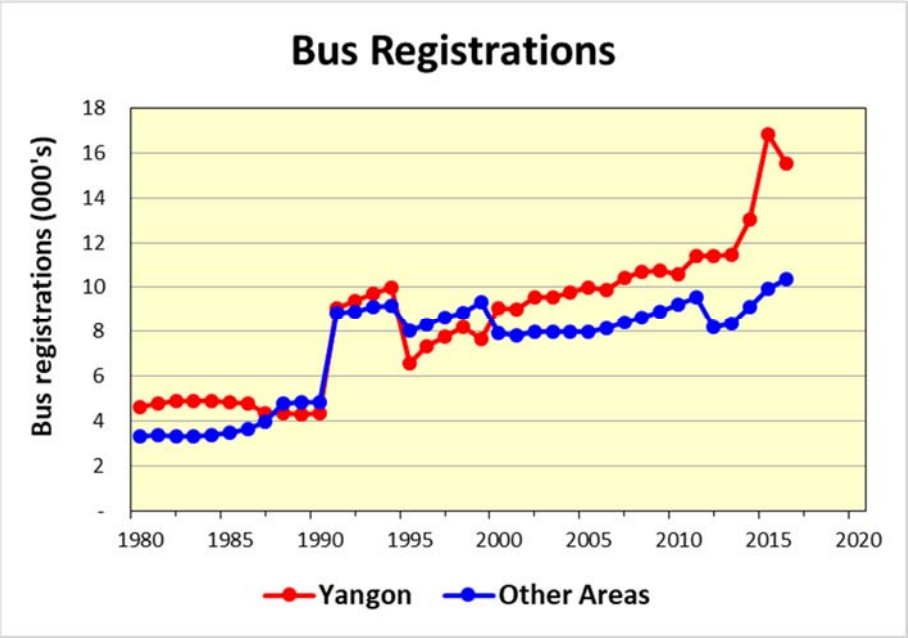

Figure 8: Bus registrations.

In Yangon, bus registrations rose from 11,393 in 2012 to 15,543 by 2016, which is a rise of 36% over the four years or 8.1% p.a. In regions outside Yangon, bus registrations rose from 8,186 in 2012 to 10,394 by 2016, which is a rise of 27%

[19] This photograph was taken on 12th January 2018, near Myawaddy.

over the four years or 6.2% p.a. The greater number of buses, especially modern buses, on the streets of Yangon and on the highways in the rural regions would have drawn passengers away from Myanma Railways both on the Circular Railway in Yangon and on the regional lines. The figures for passenger vehicles and buses are summarised in Table 10 below:

Year ended 31 March	2012	2016	Growth	Growth p.a.
Passenger Vehicle - Yangon	160,290	325,963	103%	19.4%
Passenger Vehicle - Other	89,271	136,236	53%	11.1%
Total - Passenger vehicles	**249,561**	**462,199**	**85%**	**16.7%**
Bus - Yangon	11,393	15,543	36%	8.1%
Bus - Other	8,186	10,394	27%	6.2%
Total - Buses	**19,579**	**25,937**	**32%**	**7.3%**

Table 10: The change in passenger vehicle and bus registrations from 2012 to 2016.

Nationwide, passenger vehicle registrations rose by 85% over these four years and bus registrations by 32%. It is not surprising that the number of passengers on the railways fell during this period.

A presentation by UMI Asia (Thailand) Ltd in February 2014 suggested that the decline might be due to two factors:[20]

- An increase in train ticket prices in November 2011 that made rail travel as expensive as bus travel.
- Low train speed, as well as delays and uncertain scheduling.

One could also attribute the slowness of travel to the relatively short distance between stations, and the fact that trains sometimes stop at small stops that are not really stations.[21] Table 11 shows the route length and number of stations per region or state, based on data from early 2013.[22]

[20] *UMI Asia*, (2014, February), "Myanmar's Railway Industry – Overview and Opportunities for foreign businesses". Retrieved from: http://www.s-ge.com/schweiz/export/de/filefield-private/files/76390/field_blog_public_files/40058.

[21] For example, see a photograph of Kyauk Ta Lone Station on the Ye-Dawei line, in Plate 7 in this chapter.

[22] *Ministry of Rail Transportation*, (2013, February 1), *op. cit*.

Region	Route Length (Miles)	Number of Stations	Average Distance Bewteen Stations (Miles)
Sagaing Region	443	89	5.0
Shan State	502	103	4.9
Taninthayi Region	107	25	4.4
Magway Region	705	162	4.4
Kayah State	9	3	4.3
Bago Region	461	116	4.0
Ayeyarwaddy Region	199	53	3.8
Kachin State	122	33	3.8
Mon State	221	59	3.8
Mandalay Region	657	183	3.6
Karen State	16	6	3.2
Rakkaing State	54	20	2.8
Yangon Region	158	74	2.2
Chin State	-	-	-
	3,652	**926**	

Table 11: Average distance between stations.

From these figures, one can calculate the average distance between stations.[23] On average, there is from 2.2 to 5.0 miles of route between stations. The trains on the branch lines tend to stop at each station. It is not surprising, for example, that a 102-mile trip I took by train from Aungban to Loikaw in December 2012 took over eleven hours.[24]

Even on a new line opened in May 2014, from Yangon to Hinthada on the west bank of the Irrawaddy River, the maximum speed the train could travel at was only 20 miles per hour. The locomotive in use was blamed for the slowness: a 35-year-old one manufactured in France.[25] The new line is 90 miles long, and the trip is scheduled to take six hours, giving an average speed of 15 miles per hour. There are eleven stations on the line. Work commenced on this new line in November 2009, meaning that it took approximately 4.5 years to build the 90 miles of track and stations, a construction rate of only 20 miles per annum.[26]

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[23] In calculating the average distance between stations, if it is a non-circular line one should divide by *(n-1)*, where *n* is the number of stations. For a circular line, such as in Yangon, one divides the route length by the number of stations, *n*.

[24] This was the daily No. 147 Up service, a mail train which had started from Pyinmana. It left Aungban at 10:33am (an hour late) and arrived at Loikaw at 9:52pm.

[25] Aye Min Soe, (2014, May 25), "Western parts of Myanmar gets first direct rail service to Yangon", The New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs17/NLM2014-05-25.pdf.

[26] In January 2017 I wanted to travel on this line from Yangon to Hinthada but was informed by staff at the Railway Booking Office in Yangon and also at Yangon Central Railway Station that the line was closed as there were "no passengers". I have gained the impression that this term is often used when the track has

Data on the number of passenger-miles from 1937 onwards are shown in Figure 9.[27]

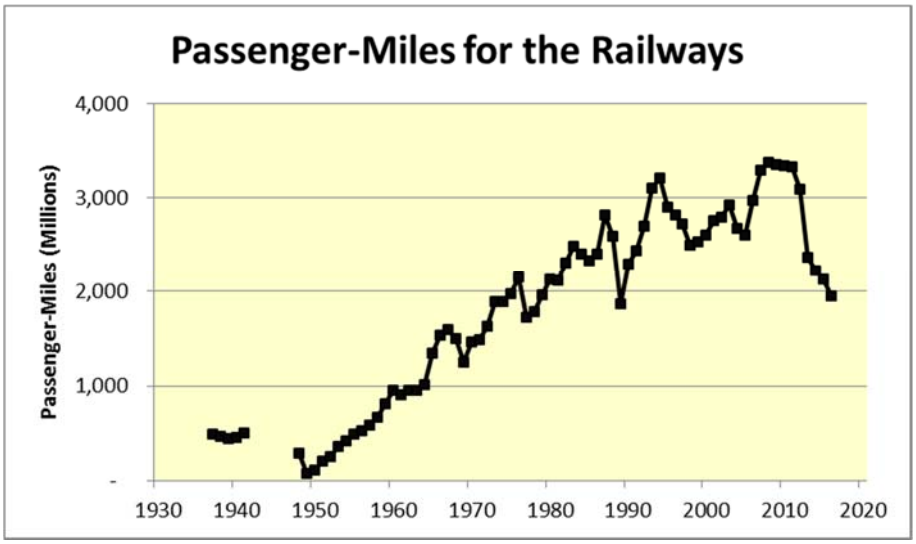

Figure 9: Passenger-miles for the railways in Burma.

Data are available for both passenger numbers and passenger-miles up to the year ended 31st March 2016.[28] Passenger-miles grew from 206 million in 1951 to peak at 3,378 million in 2008, before dropping to 1,947 million by 2016 which represents a fall of 42% (or 6.7% p.a.) over these eight years. The average growth rate for passenger-miles from 1951 to 2016 was 3.5% p.a. By contrast, for the period from 1951 to 2015, passenger numbers grew by 2.5% p.a.[29] The higher growth rate for passenger-miles indicates that the passengers were travelling longer distances by 2015. In 1951 the average distance travelled per trip was 21 miles, but by 2015 it was 44 miles.[30] The average distance travelled is shown in Figure 10.

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deteriorated and is unsafe for trains to use. This was indeed the case for this line, as a week later at Shwe Nyaung a Divisional Traffic Manager for Myanma Railways informed me that this service was closed as "the track was bad".

[27] One passenger-mile is a mile a passenger is carried.

[28] Monthly passenger-miles data are available for several months for the year ended 31st March 2016 in the *Selected Monthly Economic Indicators* published by the Central Statistical Organization. There was a sharp drop in 2013, with smaller falls in 2014 and 2015. The trend continued for the year ended 31st March 2016. This is discussed in §3.9 of this chapter.

[29] Passenger numbers are only available at present up until 2015. That is why the comparison is for the period 1951 to 2015, not 1951 to 2016.

[30] There was a high level of insurgency and dacoity after Independence, making travel by train quite unsafe. This would be the cause of the sharp drop in passenger numbers in 1949-1951, and also the sharp drop in average distance travelled in 1949 (just 10 miles per trip). See for example:

Carter, Anne, (2012), "Bewitched by Burma", Troubador Publishing Ltd, Leicester, pp.198-200; and

Lewis, (1952), *op. cit*., pp.229-239. (This is Chapter XIX, whose title is "Rangoon Express").

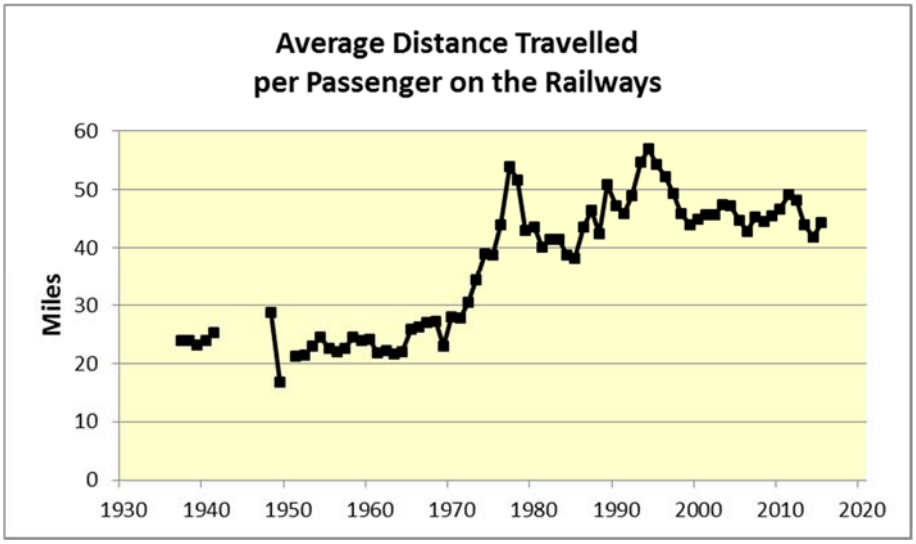

Figure 10: Average distance travelled per passenger per annum.

The current average distance of 44 miles is quite small, but is not surprising, as this reflects the large portion of suburban travel as well as the fact that on the branch lines in particular much of the travel is between small towns and villages. This is consistent with my own observations while travelling on the branch lines in Burma.

Returning to Figure 9, there is noticeable drop in passenger-miles for the period 2011 to 2016, from 3,329 million passenger-miles to 1,947 million. This is surprising given the improving economy, and represents a 42% drop over the five years. There is an even sharper drop in passenger-miles on the inland waterways, from 902 million in 2011 to 54 million by 2016, which is a fall of 94% over the five years.[31] By contrast, air travel grew by 55% from 106 million to 164 million passenger-miles for the same period, 2011 to 2016. These figures are summarised in Table 12.[32]

[31] This is on vessels operated by Inland Water Transport, and does not consider private vessels. This drop of 94% is consistent with my observations in Pathein in January 2014 and in Pyay in January 2016. The government ferry services from Pathein to Yangon and from Pyay to Yangon were no longer operating because of a lack of passengers.

[32] The data in this table are taken from the *Statistical Yearbook 2015* with the monthly publication, *Selected Monthly Economic Indicators*, being used as the source for the 2016 figures. Both are published by the Central Statistical Organization.

Year ended 31st March	Railways (Millions)	Inland Waterways (Millions)	Airways (Millions)
2011	3,329	902	106
2012	3,093	531	137
2013	2,366	210	154
2014	2,227	146	125
2015	2,123	97	153
2016	1,947	54	164
Change: 2011-2016	-42%	-94%	55%

Table 12: Passenger-miles for the railways, inland waterways and airways.

The downward trend in passenger-miles for the railways from 2011 to 2016 has continued into the year ended 31st March 2017 with a fall of 0.3% in the first six months of the financial year.[33] These figures suggest that more people are travelling by road, which would reflect the greater car ownership due to the improving economy, and more modern and better bus services operating at prices competitive with the railways. On the Mandalay-Myitkyina line Myanma Railways has tried to address the problem by cutting fares. Fares were reduced in July 2016 by 22%.[34] There are four trains per day on this line, with Shwebo, Kawlin and Naba being the main stations other than Mandalay and Myitkyina.[35] This drop in fares was due to the declining number of passengers. Myanma Railways also cut fares on the Circular Railway in Yangon in July 2016.[36] The train fare used to be Kyat 200 for all trips. In an effort to increase passenger numbers the fare for shorter distances was cut to Kyat 100, but the fare for longer trips remained at Kyat 200.[37] The result was an increase of about 1,500 passengers per day. About 71,000 passengers use the Circular Railway each day, so this represents a 2.1% increase in passenger numbers.

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[33] *Central Statistical Organization* website, *op. cit*.

See Figure 53 and Table 39 in §3.9 of this chapter.

[34] Aung Thant Khaing, (2016. July 12), "Mandalay-Myitkyina SE train fares reduced by 22%", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs22/GNLM2016-07-12-red.pdf.

[35] *The Man in Seat 61* website, *op. cit*.

[36] So Soe Yu, (2016, July 15), "Circular train passenger numbers on the rise", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs22/GNLM2016-07-15-red.pdf.

[37] The amount of Kyat 200 is in 2016 currency. It is not a large amount, and equates to approximately US$0.15 only.

3.3 The Size of the Railway Network

The size of the railway network has grown steadily over the years. Data are available for both track mileage and route mileage. Track mileage is longer than route mileage as on some routes (e.g. Yangon to Mandalay) some of the track is double track. The split between single and double track is approximately 88% single track and 12% double track, with the total route length as at March 2015 being 3,795 miles.[38] Track mileage and route mileage are shown in Figure 11.[39]

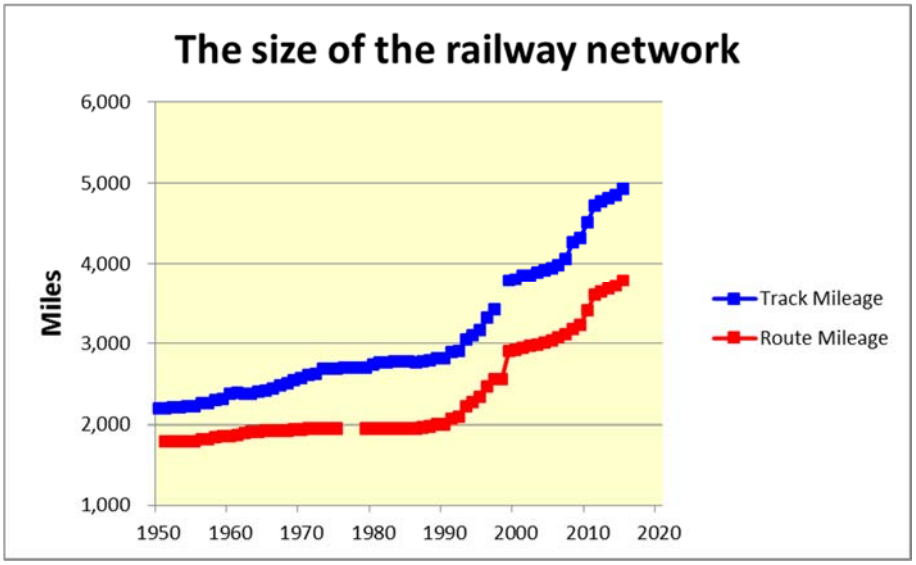

Figure 11: The size of the railway network in Burma.

From 1950 to 1990 the track length grew slowly but steadily from 2,192 miles to 2,822 miles, an average increase of 0.6% per annum or 16 miles per annum. Over the next twenty-five years, from 1990 to 2015 track length grew from 2,822 miles to 4,933 miles, an average increase of 2.3% per annum or 84 miles per annum. These calculations are shown in Table 13.[40]

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[38] *Ministry of Rail Transportation*, (2014, October 13-15), *op. cit*.

The route lengths given at this presentation were 3,285 miles of single track and 438 miles of double track, giving a total of 3,723 miles, which was the total route length as at 31st March 2014. Much of the double track is on the Yangon-Mandalay main line and the Circular Railway in Yangon, with the balance being mostly passing sections at stations on other rural lines.

[39] The Statistical Yearbooks for 1998, 2000 and 2002 show a figure for track mileage of 2,845 miles for 1998. This is possibly wrong, and has been omitted from the graph. Track mileage was 3,427 miles in 1997, and 3,789 miles in 1999.

[40] The increase measured in miles per annum is calculated using an arithmetic average. The increase measured in per cent per annum is a geometric average.

Year	Track Length (Miles)	Increase since 1950 (miles p.a.)	Increase since 1990 (miles p.a.)	Increase since 1950 (% p.a.)	Increase since 1990 (% p.a.)
1950	2,192				
1990	2,822	16		0.6%	
2015	4,933	42	84	1.3%	2.3%

Table 13: The increase in track mileage since 1950.

The figures are similar for route mileage (calculated from 1960 onwards), as shown in Table 14 below.

Year	Route Length (Miles)	Increase since 1960 (miles p.a.)	Increase since 1990 (miles p.a.)	Increase since 1960 (% p.a.)	Increase since 1990 (% p.a.)
1960	1,858				
1990	2,003	4.8		0.3%	
2015	3,795	35.2	71.7	1.3%	2.6%

Table 14: The increase in route mileage since 1960.

The accelerated rate of growth in track and route length from 1990 onwards was due to new lines being built. Unfortunately, the quality of these new lines is quite poor. The "new" lines I have travelled on are:

- Aungban to Loikaw (built in 1992).
- Pakokku to Kyangin (two sections not operating).
- Pakokku to Bagan.
- Pathein to Einme.
- Shwe Nyaung to Yaksauk.
- Taunggyi to Saikkhaung.

Two other lines from the 1990's are the Shwe Nyaung to Taunggyi line (abandoned in 2012) and the Taunggyi to Mong Nai line, which is only usable as far as Htiyi, with trains terminating at Saikkhaung since January 2017.[41] These two lines, as well as the Shwe Nyaung to Yaksauk line, are discussed in Chapter 7.

A line running twenty miles south from Dawei to Thayet Chaung has been built, but is inoperable due to poor construction. Sections of the track and some of

[41] Personal communication from the Station Master at Shwe Nyaung, on 31st January 2017.

the bridges have collapsed.[42] The plan was for the line to go to Myeik (a distance of 133 miles), but trains can just go one stop to Seik Kann, which is on the outskirts of Dawei. Even at Seik Kann the track is very poor, with the wooden sleepers deteriorating badly.[43] This station at Seik Kann and the poor quality track are shown in Plate 2.[44]

Plate 2: Looking south from the station at Seik Kann on the outskirts of Dawei.

A longer-term perspective of track development in Burma can be seen in Figure 12.[45]

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[42] Personal communication for a member of the Myanma Railways' staff at Dawei Railway Station, who described the twenty-mile section as being "terrible". Trains had stopped running two years before (i.e. in 2011). The photograph in Plate 2 was taken in December 2013.

[43] The term "sleeper" is used in the UK, Africa, Australia and New Zealand, whereas in North America the term "tie" is used. Given the British origins of the railway network in Burma, I will use the term "sleeper" in this thesis. Myanma Railways uses the term "sleeper", for example in formal presentations and when issuing out invitations to tender for the manufacture of concrete sleepers. See for example:

Consult-Myanmar, (2015, September 23), "Myanma Railways invites open tender for Raw Material for Concrete Sleeper Production; Closing Date: Oct 10th, 2015". Retrieved from: https://consult-myanmar.com/2015/09/23/myanma-railways-invites-open-tender-for-raw-material-for-concrete-sleeper-production-closing-date-oct-10th-2015/.

[44] The red arrow is indicating two badly rotted wooden sleepers. The blue arrow is indicating how the track is badly overgrown by weeds, just south of the station. This photograph was taken on 10th December 2013.

[45] The data for the period 1879-1937 were compiled by Furnivall and have been taken from:

Saito and Kiong, (1999), *op. cit.*

Furnivall also gives a figure of 2,667 miles of track for 1942, but this seems to be inconsistent with the figure of 2,060 miles in 1937. The 1942 figure has been omitted from the graph

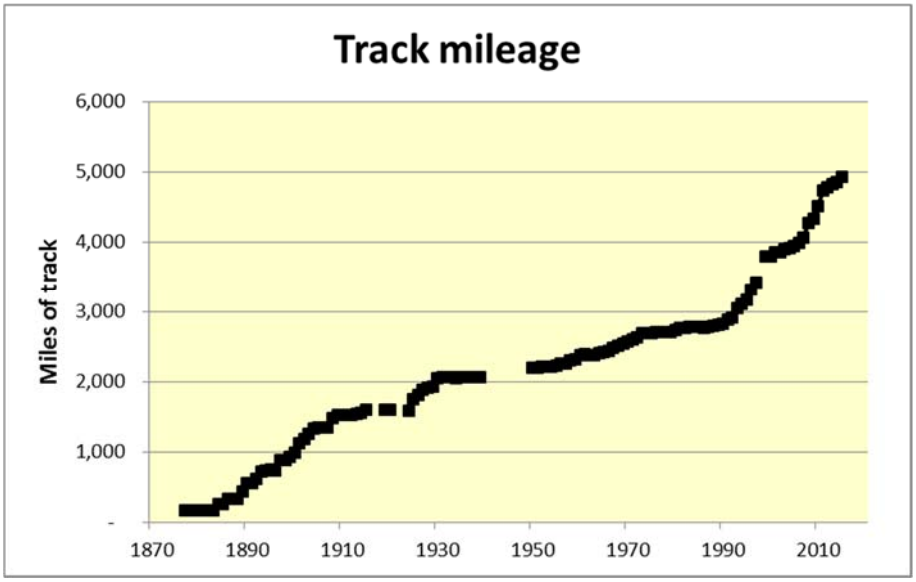

Figure 12: Track mileage from 1877 to 2015.

The graph shows track mileage and commences in 1877 when there were just 161 miles of track, which was the line from Rangoon to Prome.[46] Track was destroyed during World War II, but by 1950 there were 2,192 miles of track reported as being operational. By 2015 track length for the Myanma Railways network had grown to 4,933 miles.

The number of railway stations has been also growing quite strongly since 1990, which is due to the construction of new lines as seen in the track data above. The number of stations is shown in Figure 13.

[46] There were several motives for building this first line: economic; social and welfare; and military. The military motive was to strengthen the efficiency of the miltary and the police force, thereby saving costs. See:

Maung Shein, (1961), "State Investment in Burma Railways. 1874-1914", Economics Research Project, Economic Papers Nos. 9 & 10, Departments of Economics, Statistics and Commerce, University of Rangoon.

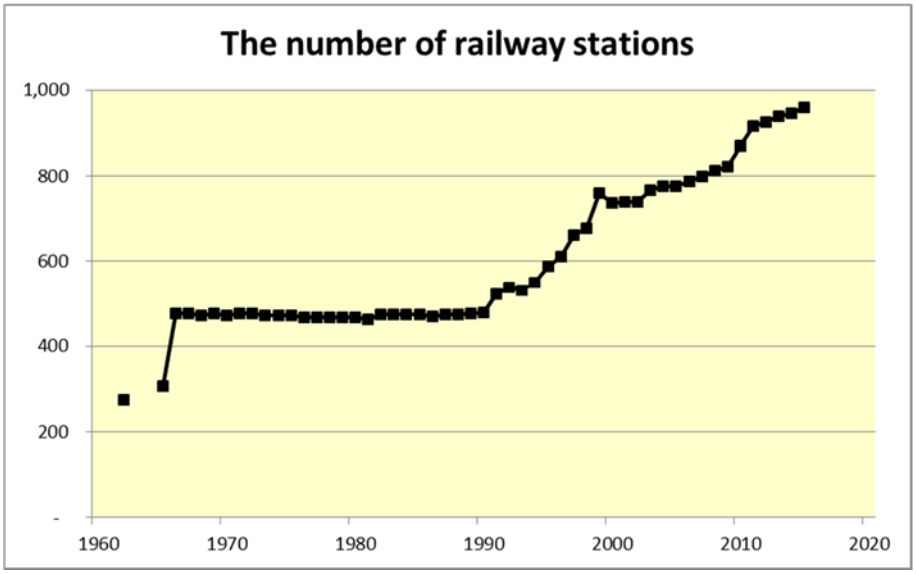

Figure 13: The number of railway stations.

The number of railway stations was quite steady from the mid-1960's to 1990, varying between 462 and 479 stations. However, from 1990 to 2015 the number has doubled from 479 stations to 960 stations. This is similar to the growth rate for route mileage, which grew from 2,003 miles in 1990 to 3,795 miles by 2015. This is an increase of 89%.

The railway stations are of varying quality. Mye Chit Station on the line from Pakokku to Seikphyu, on the west bank of the Irrawaddy River, is a typical block station on this newly constructed line, and is clean and functional, as can be seen in Plate 3.

Plate 3: Mye Chit Station, on the new line between Pakokku and Seikphyu.

Other stations are much more basic, such as the one shown in Plate 4, which is Ayadaw Station. This station is also on the line from Pakokku to Seikphyu.

Plate 4: Passengers waiting at Ayadaw Station, on the line between Pakokku and Seikphyu.

Quite a number of stations are in a run-down state, such as Dama Thaw Station on the line between Thayet and Kyangin, on the west bank of the Irrawaddy River. This is also a station on a new line, and is shown in Plates 5 and 6.

Plate 5: Dama Thaw Station, on the line between Thayet and Kyangin.

Plate 6: At Dama Thaw Station, on the line from Thayet to Kyangin.

At stations like the one at Dama Thaw the train cannot pull into the station adjacent to the platform, as the track is not complete. At this station the track adjacent to the platform is overgrown by weeds; the passengers are clambering onto the train from a makeshift set of wooden steps; and the station sign (indicated by the red arrow in the photograph) leans at a precarious angle in the background.[47]

Sometimes trains stop at places that are little more than a shelter, some seats and a sign with the station name. An example at Kyauk Ta Lone on the Ye-Dawei line is shown in Plate 7.[48]

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[47] What is also noticeable in Plates 5 and 6 above are the railway sleepers (also called ties). They are much further apart than the ones at Ayadaw Station. Both stations are on the Kyangin-Pakokku line, but Dama Thaw is further south than Ayadaw. The track at Ayadaw is quite soundly constructed, but the one at Dama Thaw is poorly constructed with the sleepers too far apart and only a small amount of ballast.

[48] Two passengers (indicated by the red arrow) can be seen waiting on the right-hand side of the track, and the railway station sign (indicated by the blue arrow) is in the background behind the shelter. The train only stopped for about one minute to pick up these passengers.

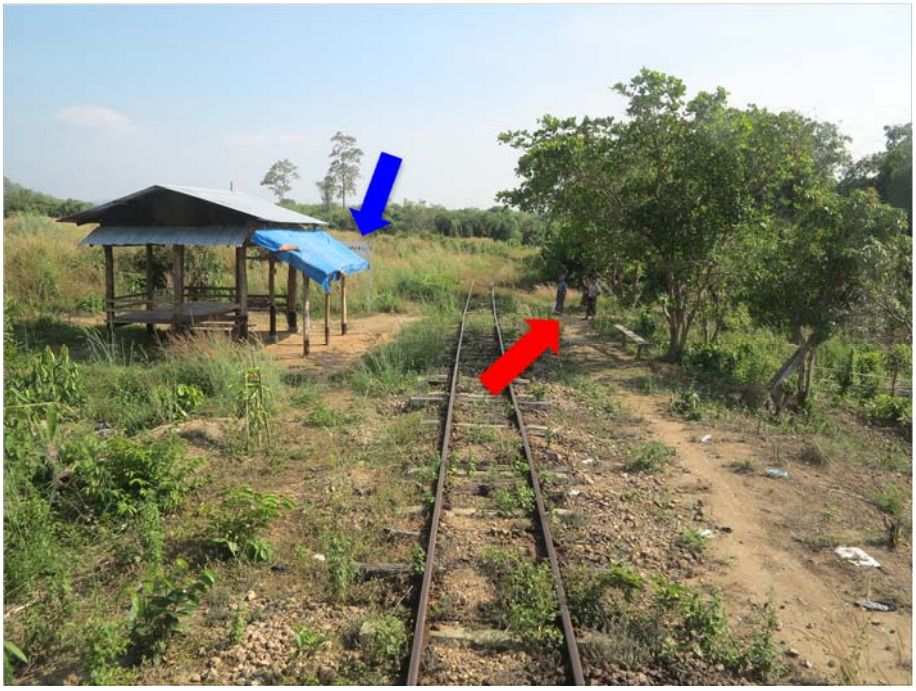

Plate 7: Kyauk Ta Lone, a very small stop on the Ye-Dawei line.

The number of railway stations in Burma may be increasing, but many of the stations are of very poor quality. The government acknowledges that the stations in the system need upgrading. In 2014 the former Deputy Minister for Rail Transportation, U Myint Thein, stated that an upgrade of the country's 960 stations would cost about Kyat 28.8 billion (about US$27 million).[49] This is only US$28,000 per station.

One measure of the efficiency of a rail network is *passenger density*, which is defined as the number of passenger-miles per mile of route per annum.[50] *Passenger density*, and *freight density* which is discussed later in this chapter, make it possible to compare one railway with another (e.g. for different countries), regardless of the difference in route length. It makes it possible not only to accurately compare one year to another for the railway network in Burma, but also to compare Burma to other countries.[51] A graph of passenger density for the period 1951-2015 is shown in Figure 14.

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[49] Pyae Thet Phyo, (2014, October 27), "High-speed rail planned by 2023", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/national-news/12079-high-speed-rail-planned-by-2023.html.

[50] Jones, Edward D., (1923), "Investments", Kessinger Publishing Co., United States, p.133.

Edward D. Jones was a leading investment banker on Wall St, founding the firm Edward Jones Investments. He used measures such as passenger density and freight density to assess US railway companies.

[51] *Ibid*.

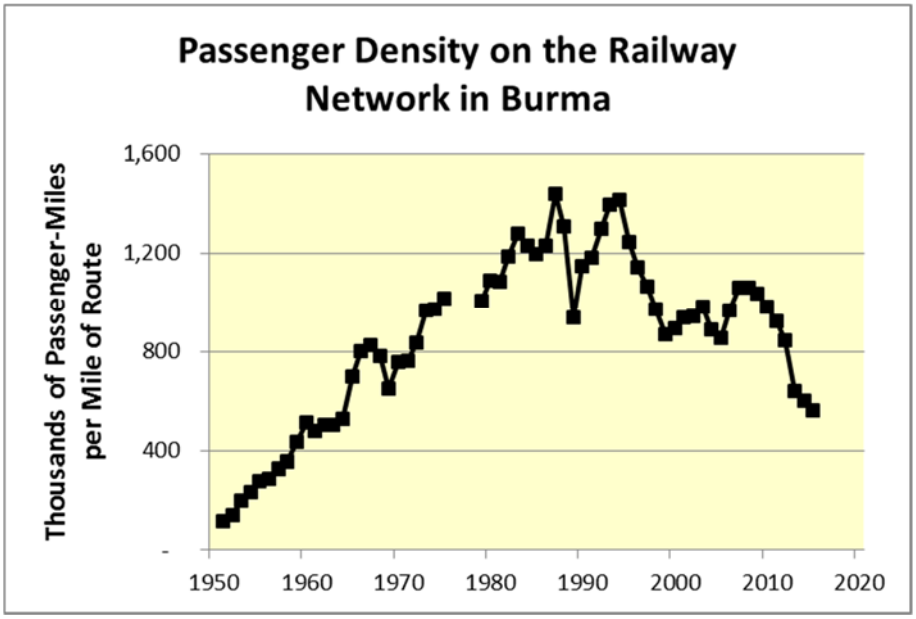

Figure 14: Passenger density on the railway network in Burma.

The passenger density peaked at 1,438,000 passenger-miles per mile of route per annum in 1987. As at 2015 there were only 559,000 passenger-miles per mile of route per annum.[52] This figure is similar to the level in the mid-1960's. The conclusion to draw is that the efficiency of the railways in transporting passengers has fallen back to what it was fifty years ago.

3.4 The Rolling Stock

The quality of the rolling stock is a key component of a railway's operational efficiency. Unfortunately, Burma has been negligent in keeping its rolling stock up-to-date. Improvement however is imminent, with Myanma Railways buying new locomotives, passenger coaches and Diesel Multiple Units (DMU's) from China, Japan and India. In addition, in July 2013 China and Burma signed a US$100 million agreement to build new rolling stock for Burma.[53] The plan is to construct

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[52] For example, the 2015 figure is calculated from passenger-miles of 2,122,743,000 divided by route mileage of 3,795 miles, giving a passenger density figure of 559,353.

[53] Boot, William, (2013, July 20), "Naypyidaw in US$100 Million China Deal to Build Train Factories", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/business/economy/burma-business-roundup-july-20.html; and

The New Light of Myanmar, (2013, July 19), "Agreement inked to construct locomotive and coach factories". Retrieved from: http://www.burmalibrary.org/docs15/NLM-2013-07-19-red.pdf; and

Eleven Myanmar, (2013, October 26), "Myanmar Railways to Buy Materials in Return for Pledged US$92M loan". Retrieved from: http://elevenmyanmar.com/business/3859-myanmar-railways-to-buy-chinese-materials-in-return-for-pledged-us-92m-loan.

The Chinese company involved is the China National Machinery Import & Export Corporation (CMC).

two new factories in Burma to build diesel locomotives and passenger coaches. Diesel locomotives will be built in Nay Pyi Taw and passenger coaches in Myitnge which is near Mandalay.[54] Funding will come from a loan from China's Export-Import Bank for 90% of the project, with the Government of Myanmar contributing 10% in equity. The target date for the factories to be operational was 2015, and one of the conditions of the US$92 million loan from China was that Burma must buy materials, technology and services required for the project from China.[55]

In September 2015 a group of twenty-four technicians from Myanma Railways travelled to China for a two-month coach design course. On return to Burma they worked with technical experts from China at the factory for assembling passenger coaches in Myitnge.[56] A new factory is being built on this 27-acre site which is about 12 miles from Nay Pyi Taw, replacing an older facility which has been at this site since the mid 1970's.[57] As is often the case in Burma, plans change. In December 2015, Myanma Railways announced that the project will construct only 60 coaches in total, and that the project will finish by November 2016.[58] By December 2016 the factory was not finished due to a shortage of funds, and completion was expected in the 2017/18 financial year.[59] Of these 60 coaches, 39 have been manufactured in China by Sifang Co Ltd, a part of China Southern Railways, with the remaining 21 to be manufactured at the facility at Myitnge.[60] These 39 Chinese-built carriages have arrived in Burma and are now in use.[61] New locomotives have also been purchased from China.[62] These coaches will be used on the Yangon-Mandalay line, on the No. 5 Up service and the No. 6 Down

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[54] *Railnews*, (2013, June 11), "Myanmar rail project feasibility study completed – Japan", *op. cit.*

[55] *Eleven Myanmar*, (2013, October 26), *op. cit.*

[56] *The Global New Light of Myanmar*, (2015, September 9), "Myanma Railway technicians receive training in China". Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-09-09-red.pdf.

[57] Khin Su Wai, (2016, December 5), "Myanma Railways to ramp up carriage production next year", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/business/24046-myanma-railways-to-ramp-up-carriage-production-next-year.html.

[58] Maung Maung Soe, (2015, December 21), "China to manufacture train coaches for Yangon-Mandalay line", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-12-21-red.pdf.

[59] Khin Su Wai, (2016, December 5), "Myanma Railways to ramp up carriage production next year", *op. cit*.

[60] *The Global New Light of Myanmar*, (2016, January 3), "Modern locomotive, coaches on trial for Yangon-Mandalay service". Retrieved from: http://www.burmalibrary.org/docs21/GNLM2016-01-03-red.pdf.

[61] Khin Su Wai, (2016, December 5), "Myanma Railways to ramp up carriage production next year", *op. cit.*

[62] A new Chinese locomotive and new Chinese coaches can be seen in Plate 9 later in this chapter. A new coach is also shown in Plate 18. This train is the No. 5 Up service.

service. These are overnight services with sleeper carriages on the train.[63] It is hoped that once the Yangon-Mandalay track is upgraded that these new coaches and locomotives can operate at 100 kilometres per hour, which is much faster than the current operating speed, reducing the time of travel between Yangon and Mandalay to eight hours.[64] The upgrade of the Yangon-Mandalay track is scheduled to be completed by 2023, with the first phase from Yangon to Toungoo scheduled to be completed by 2020.[65]

3.4.1 Locomotives

The locomotives that Myanma Railways is using are crucial to its efficiency and performance. A report published by the Asian Development Bank in 2012 indicated that over a quarter of Myanma Railways' 400 locomotives were over 40 years old, and that they were expensive to operate and maintain due in part to them originating from multiple manufacturers – i.e. in Germany, France, Japan, India and now China.[66] In addition, there are quite a number of Rail Bus Engines (RBE's) originating from Japan. The number of locomotives declined from 422 in 1930 to just 288 by 1962.[67] There was little increase from then until 2005, with 331 locomotives being recorded in 2005, a mere 7% increase over a 43-year time span. The emphasis since the early 1960's was to replace steam engines with diesel locomotives. Since 2005, there has been a promising 24% increase in numbers, from 331 in 2005 to 412 by 2015. But this figure of 412 is made up of 377 diesel locomotives and 35 steam locomotives. Myanma Railways does not have any steam locomotives operating on main-line service or branch-line service.[68] The graph in Figure 15 uses the 377 figure for 2015.

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[63] *The Man in Seat 61* website, *op. cit.*

[64] *The Global New Light of Myanmar*, (2017, April 11), "Ministries hold press conference on performance in one year". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-04-11-red.pdf.

[65] *Ibid*.

[66] The locomotives from Japan are the DD 500 class locomotives (500 horsepower) which are used for shunting. They were manufactured by Hitachi and Kawasaki.

[67] *Asian Development Bank*, (2012. October), "Myanmar Transport Sector Initial Assessment", Asian Development Bank, Manila. Retrieved from: http://www.adb.org/sites/default/files/institutional-document/33698/files/myanmar-transport-assessment.pdf.

[68] A Myanma Railways presentation in October 2014 lists 440 locomotives as at 31st March 2014, including 35 steam locomotives. The data from this presentation are not consistent with the data in the *Statistical Yearbook 2011*, which records no steam locomotives as at 31st March 2011. However, the *Statistical Yearbook 2015* (the latest one available) shows no steam locomotives for the years 2011 to 2014, but

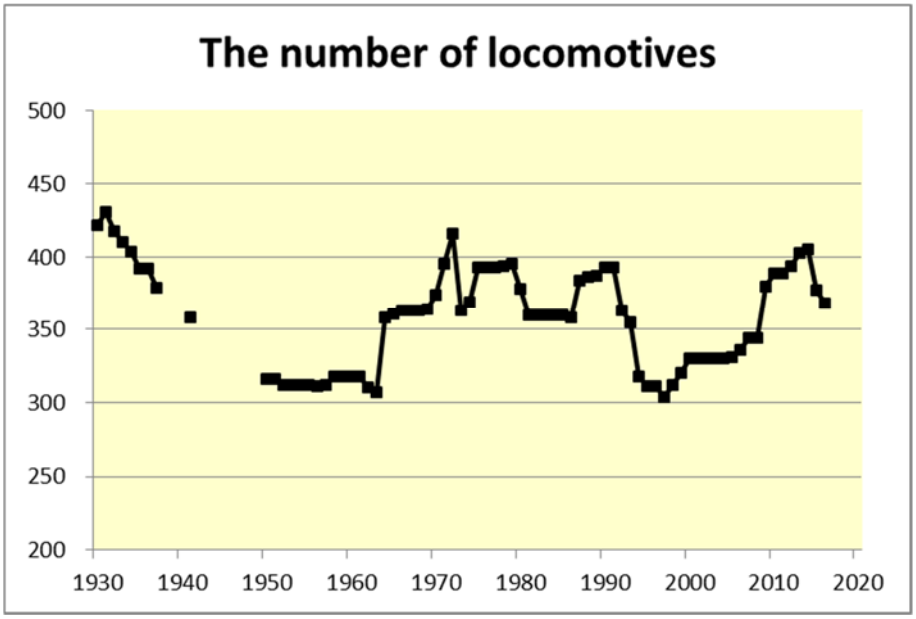

Figure 15: The number of locomotives.

Not surprisingly, diesel was replacing steam over the years, as can be seen in Figure 16.

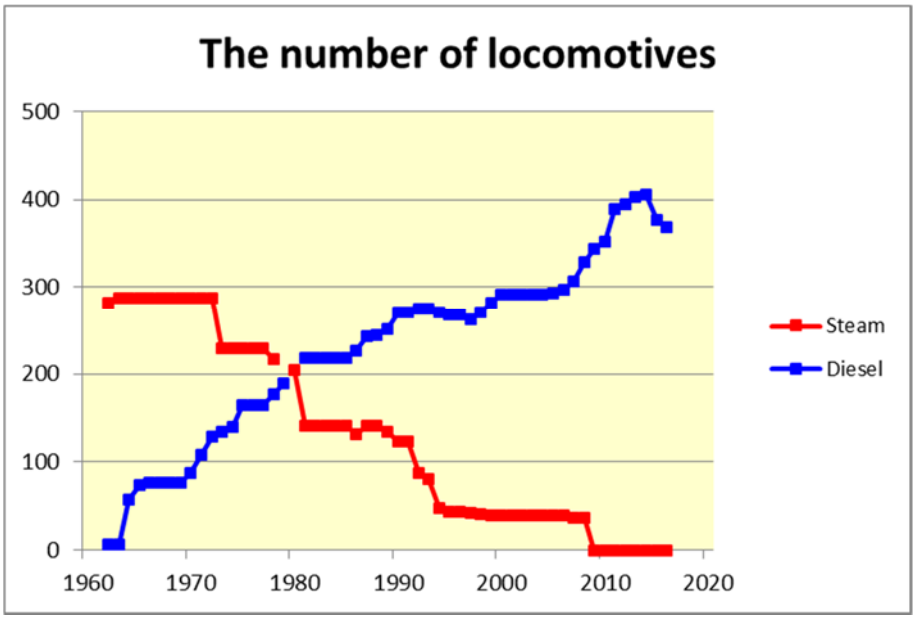

Figure 16: The number of locomotives in the network.

Burma had just six diesel locomotives and fourteen diesel railcars in 1962, compared to 282 steam locomotives.[69] Diesel has of course steadily replaced steam over the decades. Hettler reported that in 2004 that there were

inexplicably shows 35 for the 2015 year, with 377 diesel locomotives compared to 405 the year before. I have not seen any operating steam locomotives on the Myanma Railways network.

[69] *Government of Burma*, (1970), "Report to the People by The Union of Burma Revolutionary Council on The Revolutionary Government's Budget Estimates for 1969-70", Appendix 50, p.317.

approximately 40 oil-fired steam locomotives, of which twelve were serviceable and were being occasionally used (for goods trains, local passenger trains and tourist trains).[70] Myanma Railways claims to still have 35 steam locomotives in its fleet, but in my travels on the railway network I have not seen any, other than decommissioned ones at Pyuntaza on the main line between Yangon and Mandalay and at Insein in Yangon.[71] Two decommissioned steam locomotives at Pyuntaza are shown in Plate 8.

Plate 8: Decommissioned steam locomotives at Pyuntaza.

The *Statistical Yearbook 2015* gives the number of steam locomotives as zero in 2014, but as 35 in 2015. This is misleading as the tractive effort of these 35 steam locomotives is given as zero, meaning they are not in working order.[72]

The only role these days for steam is tourism. There have been two recent examples. In September 2014 Myanma Railways announced plans to introduce luxury steam-train journeys for foreign tourists, with plans to renovate decommissioned steam locomotives such as the ones at Pyuntaza shown in Plate 8, and to import luxury carriages.[73] Myanma Railways was seeking either a

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[70] Hettler, (2004, November 1), *op. cit.*

[71] *Ministry of Rail Transportation*, (2013, February 1), *op. cit*.

[72] These 35 have been omitted from Figures 15 and 16.

[73] Boot, William, (2014, October 4), "Investment Sought for Luxury Tourist Trains as Burma Railway Rusts", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/business/irrawaddy-business-roundup-oct-4-2014.html; and

foreign or a domestic partner. A service commenced operations in December 2014, with a trip once a week between Bagan and Kyaukpadaung, run by a private operator at a cost of US$199 for the round trip.[74] As at May 2015 my information from a source in Bagan was that the service only operated for two months as there were few passengers because of the high fare, which was reduced from US$199 to US$99. Another plan to use steam for tourism purposes was at Thanbyuzayat south of Moulmein.[75] Thanbyuzayat is at the end of the notorious "Death Railway" built by prisoners-of-war during World War II. A new museum was opened in January 2016, and as a part of its attractions a steam locomotive was to run along just half a mile of the route of the "Death Railway", which is much less ambitious than the failed project in Bagan. The steam locomotive may well be the same one as was used in the failed tourist operation at Bagan.[76] Longer term, there is a niche for steam in Burma, but it lies only in tourism such as running steam-train tours for foreign railway enthusiasts, especially a visit to the Bawdwin Mines Railway at Namtu.[77]

Data on the tractive effort of the locomotives are shown in Figure 17.

Kyaw Min, (2014, September 28), "Myanmar Railways Invites Tender to Introduce Luxury Trains", Myanmar Business Today. Retrieved from: http://www.mmbiztoday.com/articles/myanmar-railways-invites-tender-introduce-luxury-trains.

[74] Ei Ei Thu, (2014, December 15), "Steam train returns to rails for weekly Bagan tourist jaunt", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/national-news/12533-steam-train-returns-to-rails-for-weekly-bagan-tourist-jaunt.html; and

Seiler, Bernd, (2017, February 4), "Burma/Myanmar: Steam and Pagodas – After nine years Steam returns on Myanmar's State Railway", FarRail Tours website. Retrieved from: https://www.farrail.com/pages/trip-reports-engl/Burma-state-railway-steam-in-myanmar-2017.html; and

Anonymous, (2015, May 3). This information is from a contact in Bagan working in the tourist sector. It is best not to name this source.

[75] Kyaw Win, (2016, January 3), "Next Stop: Remembrance. Death Railway Museum to open on 4th Jan", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/3_Jan_16_gnlm.pdf; and

Su Hnin Lae and Kyaw Win, (2016, January 5), "Death Railway Museum opens", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/5_Jan_16_gnlm.pdf.

[76] I passed through Thanbyuzayat by train on 12th January 2017 and saw no sign of this steam locomotive. Indeed, the short line that had been constructed parallel to the main line (Moulmein to Ye) was becoming overgrown by weeds, indicating it was not in use.

[77] Such tours have been successfully run by FarRail Tours in the past. See:

Seiler, Bernd, (2013), "Burma Mines Railway in Namtu: The Wallah Gorge Spiral", FarRail Tours website. Retrieved from: http://www.farrail.net/pages/touren-engl/burma-mines-railway-steam-in-namtu-2013.php; and

Whitehouse, Michael, (2014, June/July), "Burma Mines", Locomotives International, Issue #90, pp.8-11; and

Anonymous, (2014, September 14), "Burma Mines Railway, steam train from Namtu to Lopah, Myanmar", a video recording on YouTube. Retrieved from: https://www.youtube.com/watch?v=MMbMH3UF7Q0.

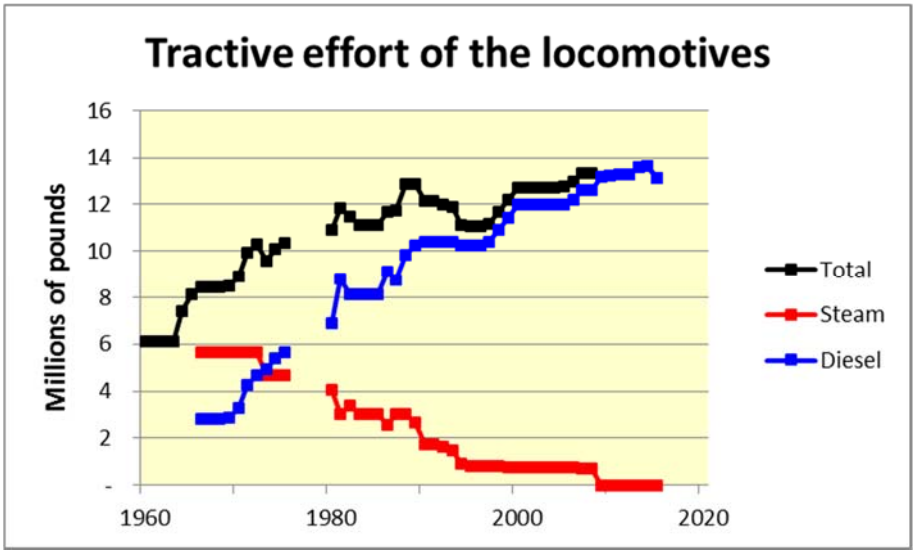

Figure 17: The tractive effort of the locomotives.

The tractive effort (measured in pounds) grew by 116% (or 1.4% p.a.) from 1960 to 2015, growing from 6.1 million pounds in 1960 to 13.2 million pounds in 2015. By the mid-1990's nearly all the tractive effort was supplied by the diesel locomotives. Even though the total number of locomotives hardly changed from 1960 to 2000, the replacement of steam by diesel saw a doubling of the total tractive effort of the locomotives. There were 141 steam locomotives in 1988, but only 39 by 2000, as they were being steadily replaced by diesel locomotives.[78] In 1998 Schofield reported that oil-fired steam locomotives hauling both passenger and goods trains were operating out of two main centres, Bago and Pyuntaza.[79] By 2000 steam locomotives were being phased out, as indicated by the statistics discussed above but also by commentary from British rail enthusiasts who visited Burma at the time. One report lists 23 individual steam locomotives in operation in 1999/2000, especially in locations such as Bago, Pyinmana, Pyuntaza and Insein, and especially for goods trains.[80]

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[78] Rainbow, Julian, (2000, Autumn), "Myanmar Railways", The British Overseas Railways Journal, No. 21, pp.148-149.

This small article contains photographs of steam locomotives in 2000 on service on the main line at Bago and on the line to Martaban.

[79] Schofield, Ray, (March-April, 1998), "Metre Gauge Steam in Myanmar", Locomotives International, #42, pp.21-23.

[80] *The International Steam Pages*, "Steamy Burma Days 1999", *International Steam* website. Retrieved from: http://www.internationalsteam.co.uk/trains/burma99.htm; and

The International Steam Pages, "Steamy Burma Days 1999/2000", *International Steam* website. Retrieved from: http://www.internationalsteam.co.uk/trains/burma00.htm; and

The International Steam Pages, "Steam in Myanmar 1996 - 2007", *International Steam* website. Retrieved from: http://www.internationalsteam.co.uk/trains/burma100.htm.

The above discussion has focused on the number of locomotives and the tractive effort they can provide. The age of the fleet is equally important. In May 2015 an official of the Ministry of Rail Transportation was quoted as saying:[81]

Out of the ministry's 377 locomotive engines, more than 200 are outdated.

The 377 figure is not consistent with the 401 locomotives reported for 2013. But what is telling is that the official is saying that over half of the locomotive fleet is outdated. Recognising this, Myanma Railways entered into an agreement in 2015 to buy US$11 million of locomotives from China National Machinery Import and Export Corporation (CMC), with the first three locomotives being scheduled to arrive in November 2015 and the remainder in 2016.[82] Myanma Railways plans to use them to replace current engines running on routes in hilly regions, for example on the Mandalay to Lashio line. These locomotives are already being used on the line from Yangon to Mandalay. Locomotive DF.2069, manufactured by CSR Sifang Co. Ltd of China, is shown in Plate 9 departing from Yangon Central Railway Station hauling a train made up of new Chinese coaches manufactured by the same company.[83]

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[81] Aye Min Soe, (2015, May 2), "Rail Transportation Ministry inks deal with China's CMC to buy locomotive engines", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-05-02.pdf; and

Pyae Thet Phyo, (2015, May 8), "Myanmar, China sign train engine deal", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/national-news/14350-myanmar-china-sign-train-engine-deal.html.

[82] Aye Min Soe, (2015, May 2), *op. cit.*

[83] Aye Nyein Win, (2016, January 19), "All aboard the new Yangon-Mandalay express", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/national-news/yangon/18535-all-aboard-the-new-yangon-mandalay-express.html.

This is the No. 5 Up express service which departs from Yangon at 3:00pm, arriving at Mandalay at 5:00am the next morning, with only four stops in between, at Bago, Toungoo, Nay Pyi Taw, and Thazi.

Plate 9: A new Chinese locomotive departing Yangon Central Railway Station.

A curious development occurred in May 2017 when the People's Liberation Army from China gave the Tatmadaw two 2,000-horsepower locomotives manufactured by CRRC Dalian Co., Ltd as well as ten passenger coaches and ten 32-ton covered freight wagons, all presumably new.[84] The locomotives and the passenger coaches would be the same as the new Chinese rolling stock being used on the Yangon-Mandalay line for the No. 5 Up and No. 6 Down services. It is reasonable to assume that the two trains are solely for Tatmadaw use, especially given that the locomotives and passenger coaches have been painted with an army-green livery.[85] One of these two locomotives, DF.2086, is shown in Plate 10 below.[86]

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[84] *The Global New Light of Myanmar,* (2017, May 27), "Snr Gen accepts CPLA's trains, meets Indian Foreign Secretary". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-05-27-red.pdf; and

Ding Xiaoxiao, (2017, May 27), "Myanmar Armed Forces welcome China donated trains", China Plus. Retrieved from: http://chinaplus.cri.cn/news/china/9/20170527/5346.html.

[85] Ding Xiaoxiao, (2017, May 27), *op. cit.*

[86] This photograph was taken on 30th January 2018 at Kalaw Railway Station. The locomotive was hauling a small goods train consisting of just five goods wagons. The train had probably come from Yaksauk, the site of a Defence Services Academy.

Plate 10: Military locomotive DF.2086 at Kalaw Railway Station.

The rolling stock was handed over in a ceremony at Yangon Central Railway Station by the Chinese Ambassador to Myanmar, and was accepted by Senior General Min Aung Hlaing, Commander-in-Chief of the Defence Services.

The DF 2000 class locomotives recently purchased from CRRC Dalian of China are Type CKD7B design, and are Bo-Bo-Bo locomotives.[87] A Bo-Bo-Bo locomotive has three independent two-axle bogies with all the axles powered. A Type CKD7B design Bo-Bo-Bo locomotive is shown in Plate 11 below.[88]

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[87] *Railway Gazette*, (2017, February 21), "Bo-Bo-Bo locomotives shipped to Myanmar". Retrieved from: http://www.railwaygazette.com/news/traction-rolling-stock/single-view/view/bo-bo-bo-locomotives-shipped-to-myanmar.html.

More than fifty of these locomotives have been ordered, in batches of ten.

[88] This photograph is sourced from the *Railway Gazette* article of 21st February 2017.

The term "bogie" is a technical railway term. It refers to an undercarriage on a railway vehicle (locomotive, passenger coach or goods wagon) which has four or six wheels pivoted beneath the end of the vehicle. Bogies allow the wheels of the vehicle to more closely follow the direction of the rails when travelling around a curve. The Bo-Bo-Bo locomotive shown in Plate 11 has three bogies with two axles on each (and therefore four wheels per bogie). In Burma, these are well-suited to lines such as the Mandalay-Lashio and Thazi-Shwe Nyaung lines which both have many curves and can get quite hilly. By contrast a Co-Co locomotive has two sets of bogies with three axles on each (and therefore six wheels per bogie). In Burma, a good example is the eighteen 1,350 horsepower locomotives recently supplied by Indian Railways. See:

Railway Gazette, (2018, March 21), "Myanmar locomotive handed over". Retrieved from: http://www.railwaygazette.com/news/traction-rolling-stock/single-view/view/myanmar-locomotive-handed-over.html; and

Wikipedia website, "Bogie". Retrieved from: https://en.wikipedia.org/wiki/Bogie; and

Wikipedia website, "Co-Co locomotives". Retrieved from: https://en.wikipedia.org/wiki/Co-Co_locomotives.

Plate 11: A Type CKD7B design Bo-Bo-Bo locomotive, manufactured by CRRC Dalian of China.

The Type CKD7B design locomotives have been customised for the conditions in Burma. These locomotives are well-suited to cope with conditions on Myanma Railways' branch lines as they are designed to cope with poor track conditions, steep gradients and tight curves down to a 62-metre radius.[89] These locomotives will be valuable on the Mandalay-Lashio line and the Thazi-Shwe Nyaung-Yaksauk line in Shan State.[90]

Myanma Railways is also involving Germany in the improvement of its locomotive fleet. In February 2017 the Pyidaungsu Hluttaw parliament in Nay Pyi Taw approved Myanma Railways taking out a five million Euro loan from the German KfW Development Bank.[91] The loan will be used to improve the

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[89] *Railway Gazette*, (2017, February 21), *op. cit.*

[90] I most recently travelled by rail from Thazi to Shwe Nyaung in late January 2017. I was surprised to see locomotives DF.2001, DF.2005 and DF.2013 still being used on the line. DF.2001 was the first of the 2,000-horsepower locomotives purchased by the then Burma Railways. It was purchased in 1985 from the French manufacturer Alstom. As discussed later (see Footnote 108 in this chapter) locomotive DF.2013 had a new engine from China installed at the Insein Locomotive Shed, but it remains a 30-year old locomotive and hopefully it and other locomotives of the DF.2000 series will be replaced by Bo-Bo-Bo locomotives, especially since for DF.2013 the new Chinese engine is considered to be "no good". DF.2004 was in use on the Ye to Dawei line in January 2017, as was DF.2007 on the Taunggyi to Saikkhaung line. Both were undergoing regular repair and need replacing.

[91] *The Global New Light of Myanmar*, (2017, February 28), "Pyidaungsu Hluttaw approves 5 million euro loan from Germany for locomotive factory". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-02-28-red.pdf; and

locomotive engine workshop at Ywa Htaung, which is on the western bank of the Irrawaddy River about 30 *km* from Mandalay. There are two main purposes: (i) to upgrade German-made engines running on the Mandalay to Myitkyina line; and (ii) to improve the Railway Technical Training Centre attached to the workshop. This diesel locomotive workshop was opened in 1975 and the training centre in 1981, with support from the German Technical Cooperation Agency (GTZ).[92] There are still a number of German locomotives in use in Burma. They are diesel hydraulic locomotives purchased from Krupp. An example of a Krupp diesel locomotive is shown in Plates 61 and 62 in Chapter 5 in this thesis. The locomotive was passing through Chaung U, which is junction for trains from Mandalay going to either Monywa or Pakokku. Ywa Htaung Station is on the Mandalay to Chaung U line and is well placed to service locomotives on this line and the Mandalay to Myitkyina line. What this project with KfW Development Bank is showing is the willingness of Myanma Railways to deal with countries other than China, India and Japan, who are the three major suppliers of rolling stock. In Burma the majority of the main-line diesel locomotives exceed the maximum axle weights on the secondary or branch lines.[93] The German-built diesel hydraulic locomotive classes DD 950 and DD 1200 were supplied to Burma Railways from 1960 to 1988, and were suitable for branch line operation, where often the curves are tighter.[94] The ones still in use are showing their age and Germany is probably hoping to supply new ones in the future.[95] The other thing this involvement with KfW Development Bank is showing is the willingness of Myanma Railways to invest in the future by putting money into training. Each year more than 80 trainees attend training courses of up to one year and 160 trainees attend courses of up to four weeks.[96]

Pyae Thet Phyo, (2017, February 20), "Myanmar Railways to seek 5-million-euro German loan", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/national-news/nay-pyi-taw/25003-myanmar-railways-to-seek-5-million-euro-german-loan.html; and

KfW Development Bank, (2016, September), "Railway Network Myanmar". Retrieved from: https://www.kfw-entwicklungsbank.de/PDF/Entwicklungsfinanzierung/L%C3%A4nder-und-Programme/Asien/Myanmar_RailwayWorkshop_2016_EN.pdf.

[92] *KfW Development Bank,* (2016, September), *op. cit.*

[93] *Ibid.*

[94] *Ibid.*

The locomotive shown in Plate 61 is DD.956.

[95] Germany is facing competition from China who has recently supplied two Bo-Bo-Bo locomotives well-suited to the branch line conditions, as discussed above.

[96] *KfW Development Bank*, (2016, September), *op. cit*.

Myanma Railways is also purchasing rolling stock from India, with the government no doubt mindful of the economic and political significance of the neighbouring country to its west, as well as a possible rail link to India in the future. India has supplied eighteen diesel-electric locomotives under a contract that was signed in March 2016.[97] The contract will be funded by an existing line of credit that was extended to Burma from India. The first six locomotives from this contract arrived in Yangon in May 2017, and were handed over to Myanma Railways in July 2017.[98] The locomotives are brand new, not reconditioned ones, and were manufactured by Diesel Locomotive Works in Varanasi, India.[99] They are less expensive than ones purchased from China.[100] A second batch of six locomotives under this contract was delivered in September 2017 and was handed over in November 2017, with the final batch of six being handed over in February 2018.[101] The first batch of six locomotives is in use on the Mandalay-Myitkyina line.[102] Locomotive DF.1368, one of the 1,350 horsepower locomotives purchased under this contract, is shown in Plate 12 below.[103]

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[97] Bhavna Vij Aurora, (2016, March 11), "India to supply 18 meter-gauge diesel-electric locomotives to Myanmar", The Economic Times. Retrieved from: http://articles.economictimes.indiatimes.com/2016-03-11/news/71416756_1_locomotives-railway-ministry-rites.

The locomotives have a capacity of 1,350 horsepower and are costing US$1.8 million per locomotive. See:

The Global New Light of Myanmar, (2017, July 23), "Myanmar to receive second batch of new locomotives from India in September". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-07-23.pdf.

[98] *The Global New Light of Myanmar*, (2017, April 23), "MR's new locomotives to arrive on May Day". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-04-23-red.pdf; and

The Global New Light of Myanmar, (2017, July 23), *op. cit*.; and

The Global New Light of Myanmar, (2018, March 20), "India hands over last batch of locomotives to Myanma Railways". Retrieved from: http://www.burmalibrary.org/docs24/GNLM2018-03-20-red.pdf.

[99] Diesel Locomotive Works is a production unit owned by Indian Railways and is the largest diesel-electric locomotive manufacturer in India. See:

Diesel Locomotive Works, Varanasi website. Retrieved from: http://www.dlw.indianrailways.gov.in/.

[100] *The Global New Light of Myanmar*, (2017, April 23), *op. cit*.

[101] *The Global New Light of Myanmar*, (2018, March 20), *op. cit*.

Railway Gazette, (2018, March 21), *op. cit*.

[102] *The Global New Light of Myanmar*, (2017, July 23), *op. cit*.

[103] This photograph was taken on 23rd January 2018 at Mohnyin, which is on the line between Myitkyina and Naba. This is a Co-Co locomotive, and has two bogies each with three axles (six wheels).

Plate 12: One of the 1,350-horsepower locomotives purchased from India.

The strategy of sourcing rolling stock, especially the locomotives, from several different countries is wise as it diversifies risk. If the bulk of new locomotives were sourced from one country, say China, there is too much risk if there is a falling-out politically between the two countries. For example, the acquisition of spare parts or replacement engines could be difficult.

In September 2015 a group of fifty-six employees from Myanma Railways was sent to China for training in the construction of diesel locomotives at CNR Dalian Locomotive and Rolling Stock Co.[104] The Myanma Railways employees, who currently work at the train factory at Insein and the diesel factory at Ywa Htaung, returned to work at the new locomotive factory being built in Nay Pyi Taw. As with the coach factory in Mandalay, the factory in Nay Pyi Taw will have a number of Chinese experts to assist in the production process, with plans to build twenty 2,000-horsepower locomotives per annum.[105] The locomotive factory is expected to begin operations in December 2017 and will employ 450 people, including engineers from China.[106] The involvement of China in both of these ventures looked like it would lock Myanma Railways into taking Chinese rolling stock (albeit manufactured in Burma) for a number of years. But the watering-

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[104] *The Global New Light of Myanmar*, (2015, September 16), "Myanmar to manufacture diesel trains next year". Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-09-16-red.pdf.

[105] *The Global New Light of Myanmar,* (2017, August 11), "Nay Pyi Taw locomotive factory to manufacture 20 locomotives annually". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-08-11.pdf.

[106] *Ibid*.

down of the coaches' project to just 60 coaches in total rather than 120 per annum suggests that the reliance on China will not be as great. However the new carriage factory being constructed at Myitnge will see Chinese-supplied machinery being installed with help from Chinese experts, suggesting a strong reliance on the Chinese at this facility.[107] The election of the National League for Democracy Party to government in November 2015 may see a further distancing of Myanma Railways from its Chinese counterparties. On the technical side, my concern would be the quality and reliability of the rolling stock that will be built at the factories in Myitnge and Nay Pyi Taw.[108]

3.4.2 Diesel Railcars

A common means of transport on the branch lines is the diesel railcar, which is a self-propelled railway vehicle designed to transport passengers. The railcar inventory of Myanma Railways is shown in Table 15.[109]

Type	Description	Sourced from	Number of Vehicles as at 31 March 2014
RBE	Rail Bus Engine	Japan	166
LRBE	Local Rail Bus Engine	Local	63
DMU	Diesel Multiple Unit	Local	6
DRC	Diesel Railcar	Local	2
			237

Table 15: Myanma Railways' Rail Bus fleet as at 31st March 2014.

The number of Rail Bus Engines (RBE's) has increased significantly in recent years. There were 83 Japanese RBE's in operation at 31st March 2009. Five years later, this number had doubled to 166.[110]

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[107] Khin Su Wai, (2016, December 5), "Myanma Railways to ramp up carriage production next year", *op. cit.*

[108] Anecdotal evidence suggests some dissatisfaction with rail equipment from China. When visiting Shwe Nyaung railway station on 31st January 2017 I observed two locomotives that had been "repowered", i.e. had had new engines installed. Locomotive DF.2001 had been repowered with a new Caterpillar engine from the US, whereas DF.2013 had a new engine from China. The Chinese engine was described by a Myanma Railways staff member as being "no good". Both locomotives were manufactured by the French company Alstom and had been purchased in the mid 1980's.

[109] *Ministry of Rail Transportation*, (2014, October 13-15), *op. cit*.

[110] The Japanese RBE's purchased over recent years are quite modern, not second-hand ones such as had previously been obtained from Japan. In Figure 18 "DMU" is short for Diesel Multiple Unit and "DRC" is short for Diesel Railcar. Given that Myanma Railways only has 166 RBE's in its fleet, it was a waste of

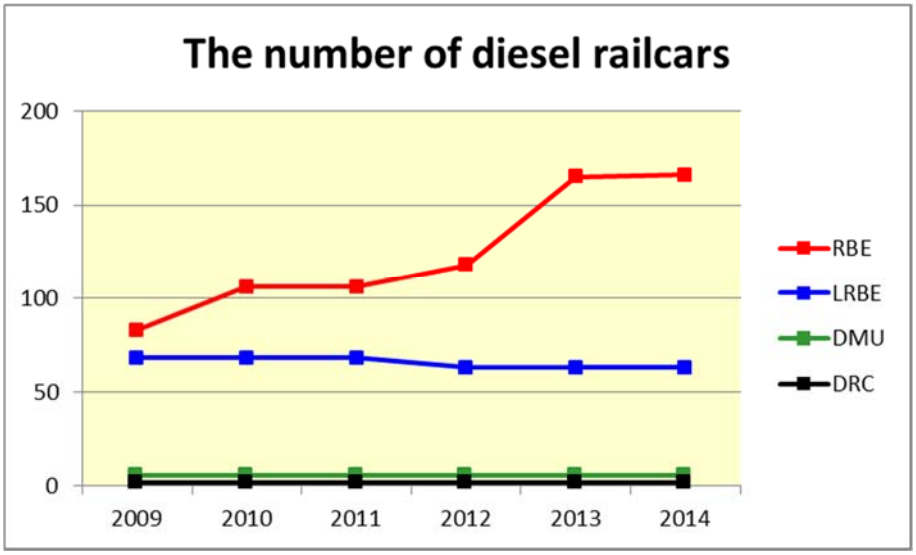

Figure 18: The number of diesel railcars.

Local Rail Bus Engines (LRBE's) are still in use on rural lines in Burma. An example of one is shown in Plate 13.[111]

Plate 13: A crowded train at Shwebo Station, on the Mandalay-Myitkyina line.

These were built from lorry parts in the railway workshops, and are powered through rubber-tyred truck wheels.[112] They were built for use on lightly-built branch lines, and many of the small carriages they haul were converted from goods

resources to transport three RBE's to Kengtung by road for the opening of the first stage of the now abandoned Shan State Railway in December 2010, and to then abandon them. (See Chapter 7).

[111] Other examples of LRBE's are shown in Chapter 5. LRBE's are alternatively known as Light Rail Buses. See:

Hettler, (2004, November 1), *op. cit.*

[112] Hettler, (2004, November 1), *op. cit*.

wagons.[113] The LRBE's are old and out-dated, usually overcrowded and uncomfortable to travel in, and should be replaced with vehicles that are more modern.[114]

An example of a modern Rail Bus Engine (RBE) is shown in Plate 14.

Plate 14: A modern RBE crossing the new road/rail bridge across the Irrawaddy River at Pakokku.

Two older Japanese RBE's are shown in Plates 15 and 16.[115]

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[113] *Ibid.*

In this thesis I will use the terms "goods wagon" and "freight wagon" interchangeably. Myanma Railways uses the term "freight wagon".

[114] The LRBE's are also in use on relatively important rural lies such as the Yangon to Pyay line. In February 2016 I travelled on the No. 610 Down LRBE service from Pyay to Letpadan, departing Pyay eight minutes late at 12:43pm and arriving at Letpadan at 6:20pm. The journey was very uncomfortable (very crowded, much jarring due to poor suspension) and in addition there were diesel fumes in the cabin. (I was in the second carriage of the three-car train, shown in Plate 22).

[115] The interior of these two RBE carriages shown in Plate 15 was noticeably older than the interior of the red-and-cream coloured modern RBE's. The RBE's at Minbu Station were no doubt second-hand when they came from Japan. They still show destination signs on the side of the carriage written in Japanese *kanji*.

Plate 15: A Japanese RBE at Minbu Railway Station, on the Kyangin-Pakokku line.

Plate 16: An old Japanese RBE at Htugyi Station on the line between Thayet and Kyangin.

The diesel railcars, whether they are the Japanese RBE's or the LRBE's, can become very crowded as there are no reserved seats. An example of a crowded diesel railcar on the Pakokku-Seikphyu line is shown in Plate 17. Passengers on

the branch lines often have bulky luggage, which makes movement in the carriage difficult.[116]

Plate 17: A crowded RBE on the Pakokku-Seikphyu line.

The number of trains per day on Myanma Railways is shown in Table 16.[117]

	Number of trains per day, as at March 2014
Passenger trains	
Express	42
Mail and others	66
Mixed	60
Rail Bus	30
	198
Suburban trains in Yangon	215
Freight trains	30
	443

Table 16: The number of trains per day.

As can be seen in this table, Myanma Railways is reporting that there are only 30 Rail Bus trains per day, yet there are 166 RBE's in the fleet, as shown in Table 15 above. This suggests a great under-utilisation of these vehicles.

[116] This photograph was taken at 7:40am on Monday 14th January 2013, at Tant Kyi Taung Station. The train consisted of two diesel railcars.

[117] *Ministry of Rail Transportation*, (2014, October 13-15), *op. cit*.

3.4.3 Passenger Coaches

The trend in the number of passenger coaches is shown in Figure 19.

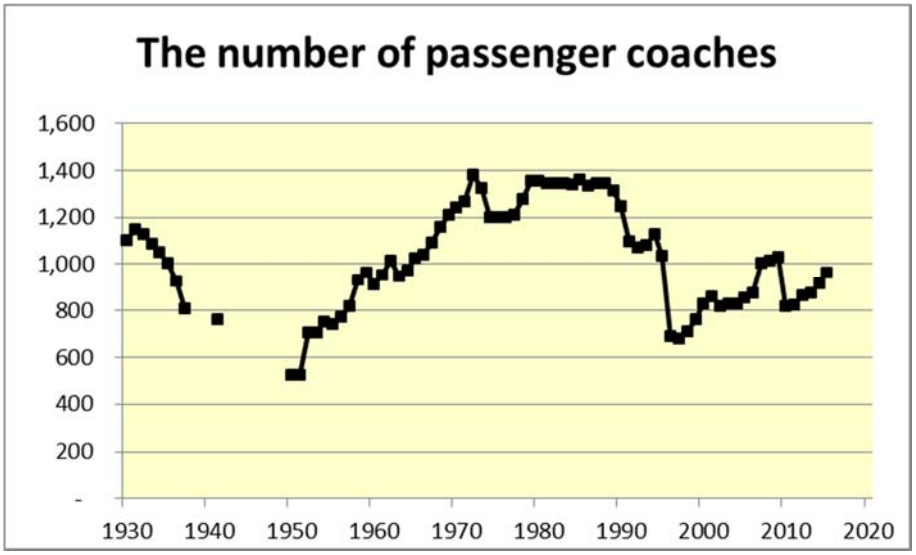

Figure 19: The number of passenger coaches.

In 1930 there were 1,102 passenger coaches as well as 302 other coaching vehicles (e.g. brake vans).[118] During the Great Depression in the early 1930's Burma Railways allowed the number of passenger coaches to fall, as happened with other railways around the world.[119] With the destruction of rolling stock during World War II, the number of passenger coaches fell to just 527 by 1950. The strong growth in the 1950's in particular would have reflected the replacement of rolling stock destroyed during the war.[120] The losses during the war were massive:

- 285 of the 350 locomotives were destroyed.
- 7,000 of the 9,500 goods wagons were destroyed.
- 956 of the 1,156 passenger coaches were destroyed.
- 44 major stations and all their installations were destroyed.

The above destruction amounted to about 48% of the facilities of Burma Railways.[121] So bad was the damage that one report described the railways in

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[118] Andrus, J. Russell, (1947), "Burmese Economic Life", Stanford University Press, California, p.242.

[119] *Ibid*., p.241.

[120] Mains, Tony, (1973), "The Retreat from Burma. An Intelligence Officer's Personal Story", W. Foulsham & Co. Ltd, London; and

Mains, A.A., (1994), "A Soldier with Railways", Picton Publishing (Chippenham) Limited, Wiltshire, United Kingdom; and.

Cook, (1957), *op. cit*.

[121] *Government of the Union of Burma*, (1954), "Pyidawtha. The New Burma", Economic and Social Board, Rangoon, p.58.

Burma as ceasing to exist as a transport system after the war.[122] From the early 1950's there was a period of steady growth over the next two decades, with the number of passenger coaches reaching 1,372 by 1972. However, over the next twenty-five years (from 1972 to 1997) the number of passenger coaches halved, falling to 682 by 1997.[123] A period of steady growth then followed, with the number of passenger coaches reaching 1,007 by December 2012, together with 274 other coaching vehicles such as brake vans and mail vans, giving a combined total of 1,281 coaching vehicles. By March 2013 the number of passenger coaches had fallen to 877, possibly due to old coaches being taken out of service. But new passenger coaches have been added to the Myanma Railways' fleet (either second-hand coaches from Japan or new coaches from China), and by March 2015 the total number of passenger coaches was 965. One of the new Chinese coaches being used on the Yangon-Mandalay Express is shown in Plate 18 below.[124]

Plate 18: One of the new Chinese coaches being used on the Yangon-Mandalay Express.

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[122] *Ibid*.

[123] *The Government of the Union of Myanmar*, (1997, August), *op. cit*.

[124] Khin Su Wai, (2016, December 5), "Myanma Railways to ramp up carriage production next year", *op. cit.*
The interior of these new Chinese coaches can be seen at:
The Man in Seat 61 website, *op. cit*.

The seating capacity also dropped from the early 1970's, from 51,507 seats in 1973 to 42,386 seats by 2008, which is a decline of 18% over the 35 years. This compares with an increase in passenger numbers of 38% for the same period. These figures are summarised in Table 17.

Year	1973	2008	% change
Passenger numbers (000's)	55,060	75,959	38%
Seating capacity	51,507	42,386	-18%

Table 17: The change in passenger numbers and seating capacity between 1973 and 2008.

The year 2008 is chosen in Table 17 as this is the year the passenger numbers peaked, at just under 76 million p.a. This lack of seating capacity could be one cause of the subsequent decline in passenger numbers, which fell to 47.9 million p.a. by 2015.

The seating capacity for the years 1930-2015 is shown in Figure 20. At 40,110 seats in 2015, it is virtually back to the level it was at in the late 1960's. Not all of these seats are individual seats, as some older carriages have wooden benches only, and the diesel railcars do not have individual seats.

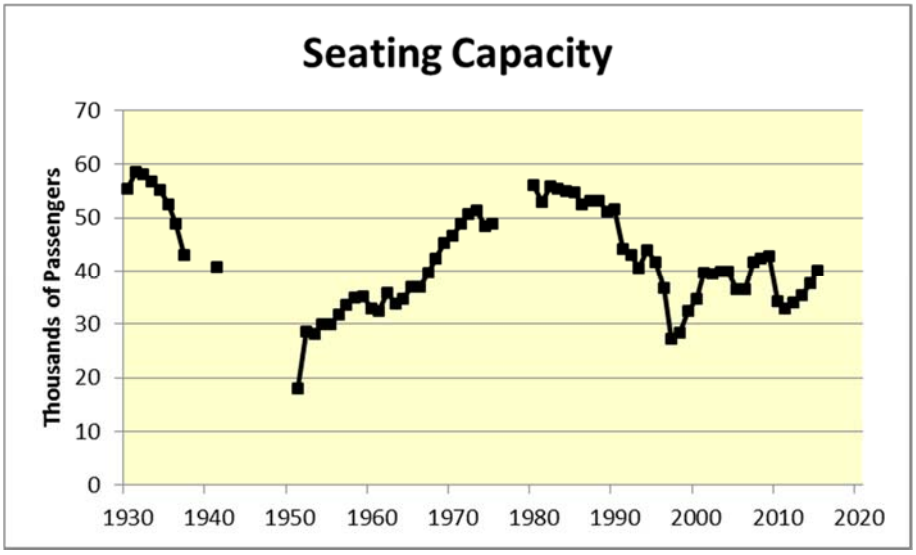

Figure 20: The seating capacity on Myanma Railways.

The result of an increase in passenger numbers accompanied by a decline in seating capacity is overcrowding, particularly in Ordinary Class and also on the diesel railcars where there is just one class of travel. When travelling from Mandalay to Myitkyina in January 2010, there was a free-for-all when the train arrived at Shwebo, a major stop, with passengers jostling to secure seats in Ordinary Class. The commotion was so bad that I was ordered by the Railway Police to return to my Upper Class seat in another carriage. It is not uncommon to

see passengers in Ordinary Class travelling in very crowded conditions on the trains. On one occasion in February 2016 when travelling on the Yangon-Pyay line, I saw passengers (including children) travelling in open goods wagons on a mixed passenger/goods train.

A measure of overcrowding is the number of seats per thousand passengers per day, calculated as:

$$Seats\ per\ thousand\ passengers\ per\ day = \frac{Seating\ capacity\ x\ 365}{(Passenger\ numbers/1{,}000)}.$$

This is an approximate measure as it assumes a seat is only used once a day. Clearly on the Circle Train in Rangoon, for example, this is not the case. But the above metric serves as a good proxy to indicate the level of overcrowding. The lower the number, the higher the overcrowding. This number fell steadily from the early 1980's (when it was 421 seats per thousand passengers per day) to just 174 seats per thousand passengers per day by 2010. With the dramatic decline in passenger numbers in recent years, this figure has bounced back to 303 seats per thousand passengers by 2015, as can be seen in Figure 21 below.[125]

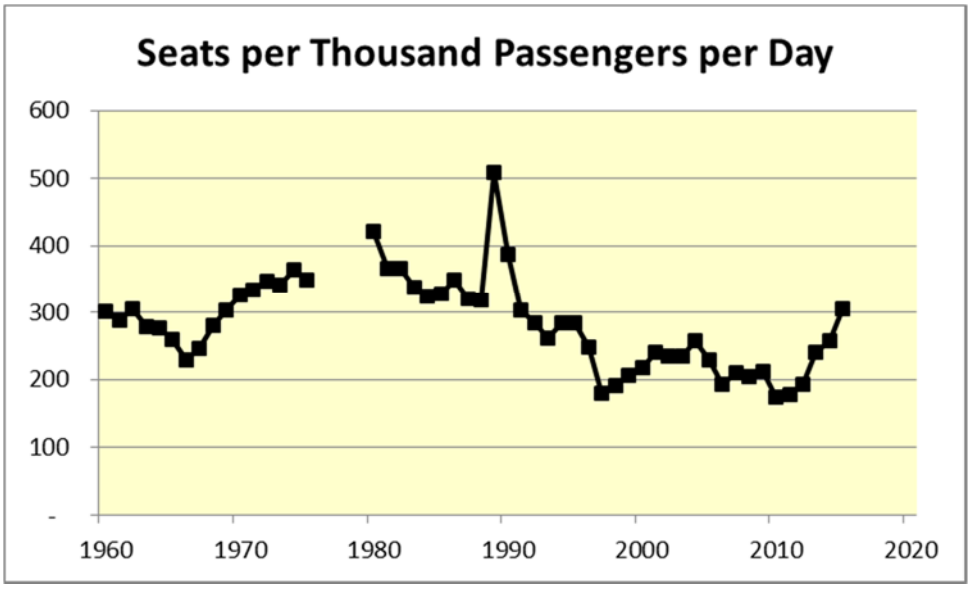

Figure 21: The number of seats per thousand passengers per day.

[125] There is a spike in the graph in 1989 to 508. This is for the year ended 31st March 1989, covering the period of serious political unrest in August 1988 and afterwards. The seating capacity was still the same, but passenger numbers fell dramatically, leading to less overcrowding.

The decline in the number of coaches and the seating capacity may have been due to the removal from service of some, but not all, of the very old small coaches, the so-called “box-car carriages” shown in Plates 19, 20 and 21.[126]

Plate 19: Small coaches at Taungdwingyi in 2011, on the line from Yangon to Bagan.

Plate 20: Small passenger coach at Hinthada Railway Station in January 2013.

[126] The term “boxcar” is more commonly used to describe freight cars in the US, but has also been used to describe these very old small carriages.

I observed coaches like the one in Plate 20 in use in January 2012, at Bago Station, and on the line between Mandalay and Monywa. A small local train leaving Kalaymyo Station in December 2013 is shown in Plate 21.[127]

Plate 21: Box-car carriages on a train leaving Kalaymyo Station.

I travelled on an LRBE service from Pyay to Letpadan in February 2016. The first coach had the bus engine and also carried some passengers who had to put up with the engine fumes; the second coach was of a similar style; and the third coach was a box-car carriage like the ones shown in Plates 19 to 21 above. This train hauled by LRBE.24 is shown in Plate 22 below. The box-car carriage, indicated by the red arrow, can be seen at the rear of the train.

[127] The small engine, a Local Rail Bus Engine (LRBE), which was pulling this train was powered by a diesel engine, with a drive-shaft attached to an axle with two wheels with rubber tyres resting on the rails. The locomotive on the blue train at Shwebo in Plate 13 is also a Local Rail Bus Engine (LBRE No. 42).

Plate 22: The LRBE I travelled on from Pyay to Letpadan.

Plate 23 shows how overcrowded it was at times, with the inside of the coach so crowded that passengers had to stand on the outside as the train was travelling along.[128]

[128] In Plate 21, passengers can be seen sitting on the steps and standing outside the carriage as the train leaves Kalaymyo Station.

Plate 23: Overcrowding on the last coach of the train from Pyay to Letpadan.

The LRBE's wheels are shown in Plate 24 below. There are normal steel train wheels to guide the engine along the track, plus rubber tyres on a truck wheel on an axle to provide the power.

Plate 24: The rubber tyre on a wheel on an axle, providing power to move the LRBE along the track.

In September 2014 the Deputy Minister for Rail Transportation, U Myint Thein, acknowledged that the carriages on Myanma Railways need improving, stating that:[129]

> *30 percent of Myanma Railways' trains are "very old", while half of its carriages are "in very bad condition".*

However, it is not these sort of box-car carriages that are at the heart of Myanma Railways' problems with rolling stock. Carriages such as these box-car ones and the LRBE trains, whilst uncomfortable for the passengers, only transport a small portion of total passengers. The quality of the passenger coaches on the branch lines is poor. Many of the ones on the main line (i.e. Yangon to Mandalay, and Yangon to Moulmein) are sub-standard. The ones on the branch lines are worse. Typical coaches on a branch line are shown Plates 25 and 26.

Plate 25: Carriages on a train at Wan Tin Station, on the Pakokku-Kyawtha line.

[129] Htoo Thant, (2014, September 19), "MP's approve request for $270m in foreign loans", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/national-news/11677-govt-seeks-approval-for-270m-in-foreign-loans.html.

Plate 26: Inside a carriage on the train from Pakokku to Kyawtha.

Both these photographs were taken on the branch line from Pakokku to Kyawtha, with the passengers seated in quite crowded conditions on wooden seats running parallel to the direction of travel. It seems ironic that Myanma Railways has plans for a very expensive project to install optical fibre cable along the railway lines on its 6,000 *km* network when it has rolling stock such as this still in use.[130]

To help address the situation with poor quality passenger coaches the government is seeking a US$45 million loan from South Korea to purchase 100 passenger coaches.[131] This order consists of 20 air-conditioned coaches, 20 Upper Class coaches, and 60 Ordinary Class coaches. This is part a broader co-operation scheme between Burma and South Korea on rail transportation.[132] Daewoo Group from South Korea will supply the passenger coaches.[133] Many of the existing carriages in the network were manufactured by Daewoo.

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[130] *Myanma Railways*, (2015, February 18), *op. cit*.

[131] Htoo Thant, (2014, September 19), *op. cit*.

[132] *The New Light of Myanmar*, (2014, September 22), "Myanmar, Korea to cooperate on rail transportation". Retrieved from: http://www.burmalibrary.org/docs19/NLM2014-09-22-red.pdf.

[133] *The New Light of Myanmar*, (2014, September 15), "Transfer of share, modern rail transportation discussed". Retrieved from: http://www.burmalibrary.org/docs19/NLM2014-09-15-red.pdf.

3.4.4 Goods Wagons

The trend for the number of goods wagons is similar, with numbers declining at a greater rate than the rate for passenger coaches. The total number of goods wagons fell from 8,093 in 1960 to just 1,439 by 2011, but by 2015 had risen to 1,811. This is shown in Figure 22.

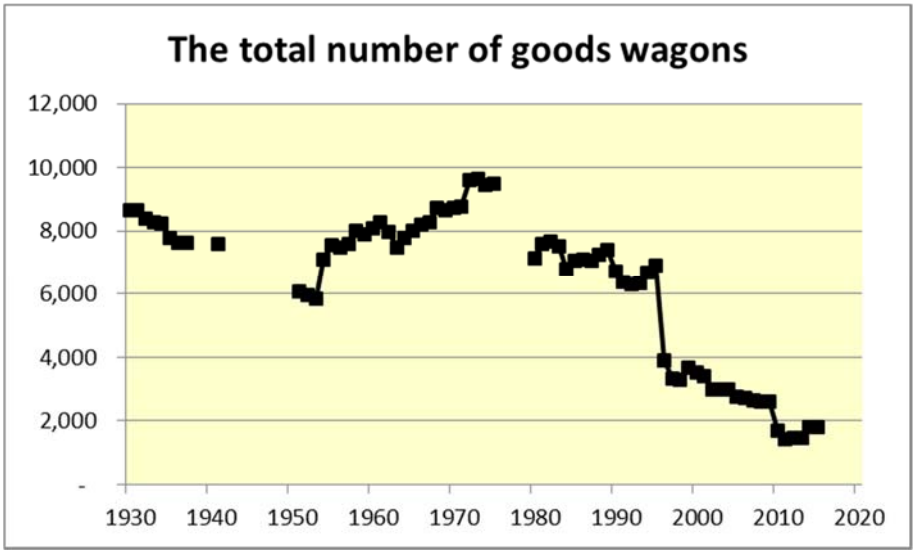

Figure 22: The total number of goods wagons.

In 1996 there were 3,896 goods wagons, compared to the latest figures (for 2015) of just 1,811 wagons. This is a fall of 54% over these 19 years, or 4.0% p.a.

The figures can be broken down into wagons with four wheels (such as the first carriage in the train shown in Plate 19 above) and wagons with bogies. The number of four-wheeled goods wagons declined considerably, from 6,679 in 1960 to just 11 by 2015.[134] The fall in the number of four-wheeled wagons is understandable, as modern goods wagons have bogies. However, the number of wagons with bogies has changed little over the last fifty years, as can be seen in Figure 23.[135]

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[134] The *Statistical Yearbook 2011* records 613 four-wheeled goods wagons as at 31st March 2009. It appears that over 600 of these were taken out of service over the following two years.

[135] There is an inconsistency in the data between numbers reported in the *Statistical Yearbook 2011* and a Myanma Railways presentation in February 2013. See:

Ministry of Rail Transportation, (2013, February 1), *op. cit*.

The data in the presentation appears to be counting four-wheeled goods wagons, whereas the Statistical Yearbooks do not. The presentation lists 3,204 goods wagons as at 31st December 2012, whereas the *Statistical Yearbook 2015* shows just 1,439 as at 31st March 2011. For consistency in the graph in Figure 23, I have used the data from the *Statistical Yearbook 2015*. In my own travels by rail in Burma I have observed very few four-wheeled goods wagons in use.

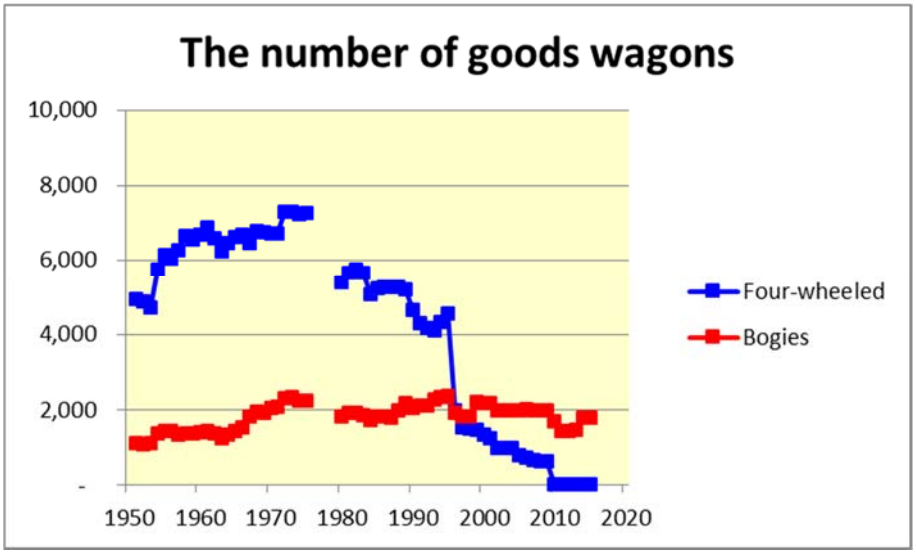

Figure 23: The number of goods wagons.

The goods wagons with four wheels that have been taken out of service have not been replaced by the more modern ones with bogies. The decline in the number of goods wagons in many ways reflects the poor state of the economy during much of this time, and the lack of government spending on essential infrastructure areas such as railways. It is understandable that the four-wheeled goods wagons have been taken out of service. Nevertheless, the growth in the number of goods wagons with bogies is very poor, as can be seen in Figure 24.

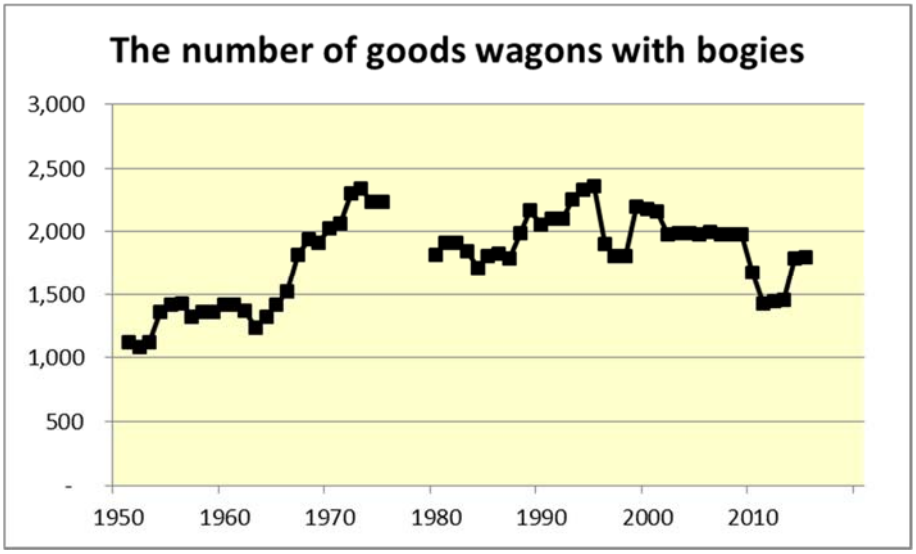

Figure 24: The number of goods wagons with bogies.

In 1960 there were 1,414 goods wagons with bogies.[136] By 2015 it had risen to 1,800, which is just below the level in 1967, when there were 1,819 wagons with

[136] The figure of 1,414 for 1960 is taken from the *Statistical Year Book 1969*. This is lower than a figure of 1,547 given in the *Statistical Year Book 1963*. See:

bogies.[137] In the 48 years between 1967 and 2015, there was no increase in the number of wagons with bogies.

The carrying capacity of the goods wagons is probably a more important figure than the actual number of goods wagons. There has been a steady decline in the carrying capacity of the goods wagons since the mid-1970's, as can be seen in Figure 25.

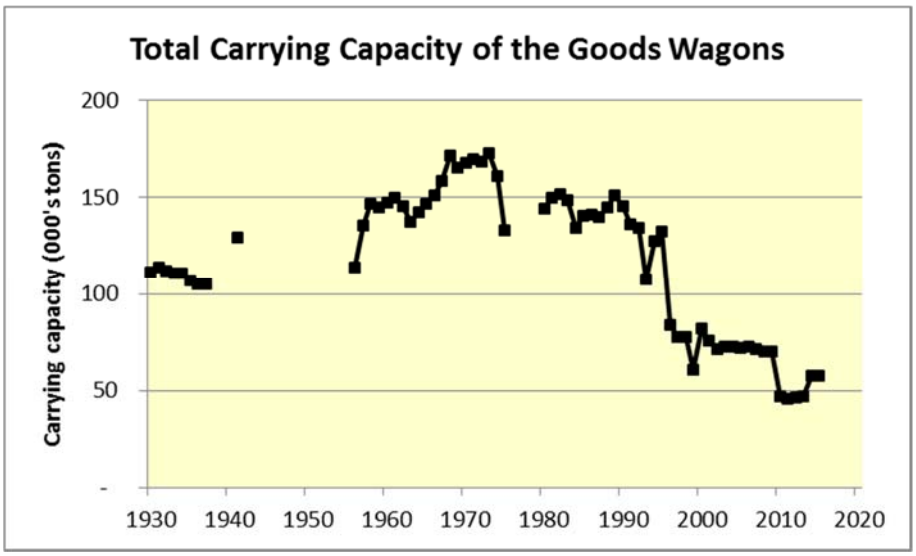

Figure 25: The total carrying capacity of the goods wagons.

By 2011 the total carrying capacity of the goods wagons was only 45,800 tons, which is considerably below the peak figure of 173,000 tons in 1973, and less than half of the figure of 111,000 tons recorded in 1930. By 2015 it had recovered to 57,800 tons following the addition of more goods wagons to the rolling-stock fleet. Virtually all of the carrying capacity now lies with the goods wagons with bogies (rather than the four-wheeled goods wagons), as can be seen in Figure 26.

The Government of the Union of Burma, (1969), "Statistical Year Book 1969", Central Statistical and Economics Department, Rangoon.

[137] The data in this graph are the same as for the red line in the previous figure, but are shown separately here to highlight the changes that have occurred.

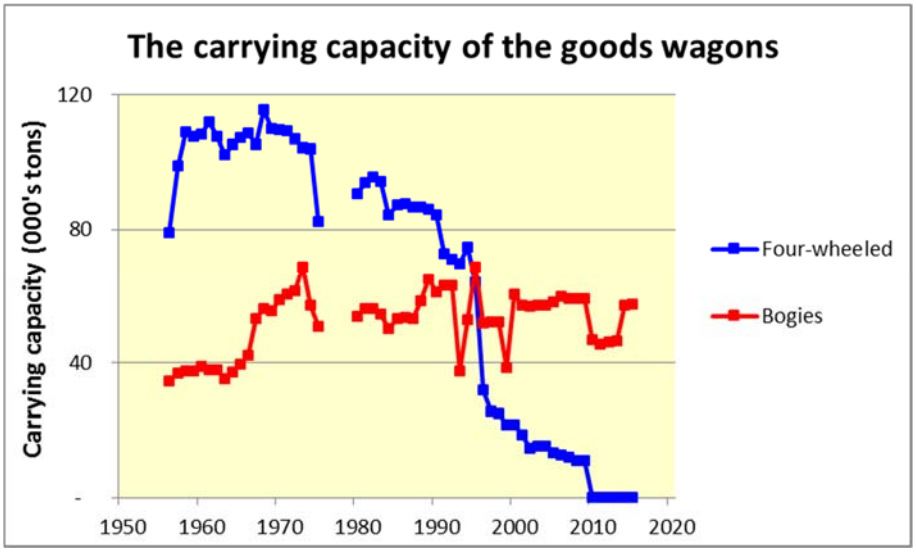

Figure 26: The carrying capacity of the goods wagons.

What stands out from this graph is that even though the carrying capacity of the four-wheeled vehicles has fallen to virtually zero, the carrying capacity of the wagons with bogies (i.e. modern wagons) has trended sideways since the early 1970's. Table 18 shows the figures for 2015 compared to 1970.

Type of goods wagon	Units	1970	2015	% Change
Four-wheeled	Tons	109,503	176	-100%
Bogies	Tons	58,845	57,600	-2%
Total	Tons	**168,348**	**57,776**	**-66%**

Table 18: The carrying capacity of the goods wagons

The total carrying capacity fell from 168,348 tons in 1970 to just 57,776 tons by 2015, a fall of 66% over the 45 years. This is a damning figure when considering the role Myanma Railways should be playing in transporting freight, but as indicated earlier it also reflects the weak state of the Burmese economy for much of this period.

3.5 Freight Transported by Rail in Burma

The amount of freight transported by rail in Burma is small for a country the size of Burma, measuring just 2.28 million tons in 2015, a figure which is similar to the amount that was being transported in the late 1950's, and is less than what was being transported before World War II. This can be seen in Figure 27.

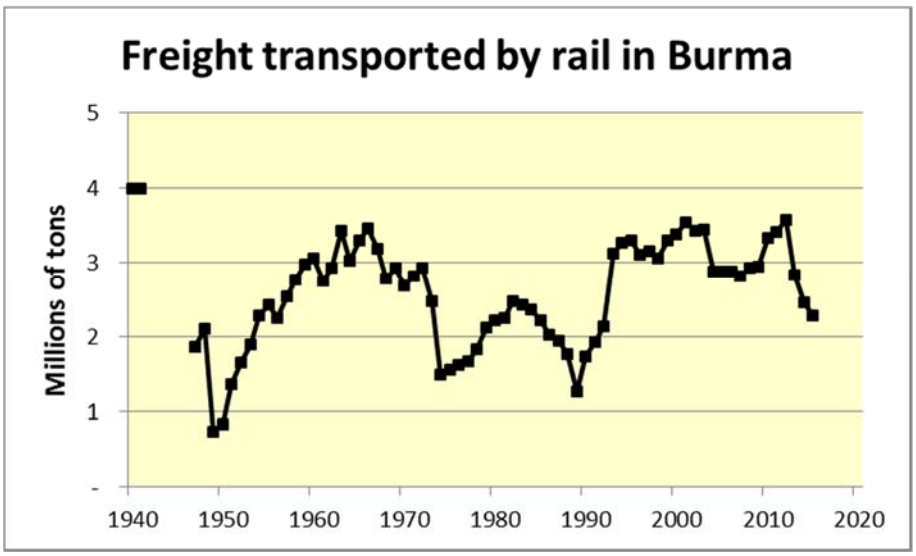

Figure 27: Freight transported by rail in Burma.

As with passenger numbers, the amount of freight transported fell sharply in 1988/89 following the upheaval in the political situation. There was a marked rise of 22% in freight from 2008 to 2012 (from 2.93 million tons to 3.58 million tons), unlike passenger numbers which fell by 15% during the same period. However, in the subsequent three years (2012-2015) the volume of freight fell by 36%, from 3.58 million tons to 2.28 million tons. Such a downward trend is worrying, and reflects the greater number of trucks on Burma's roads transporting freight. The number of heavy-duty truck registrations is shown in Figure 28 below:

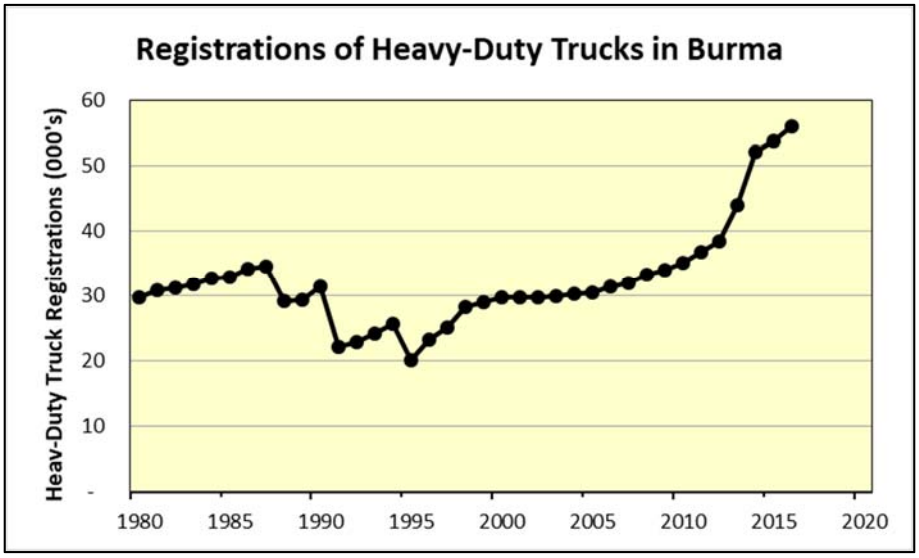

Figure 28: The number of heavy-duty truck registrations in Burma.

The number of registrations in Burma of heavy-duty trucks rose from 38,478 in 2011/12 to 55,989 by 2015/16, an increase of 46% over the four years or

9.8% p.a.[138] This sharp rise in the number of heavy-duty truck registrations from 2012 onwards is apparent in the graph.

Of interest, the amount of freight transported before World War II was significantly higher than today. The data for 1940-1956 are taken from Cook, who points out that the amount of freight traffic "*is a favourite indicator of the economic activity of a country".*[139] Freight transport by rail has clearly been languishing in Burma over the last sixty years or more. In an interesting move in March 2016, Myanma Railways announced that private goods train services would be running between Yangon, Mandalay and Myitkyina.[140] The two companies who won the tender to form a joint venture to operate this service were Asia Sun Logistics Co. Ltd and Resources Group of Logistics. Each company has the right to transport freight for twenty years.

A graph of freight-ton-miles on the railways in Burma is shown in Figure 29.[141]

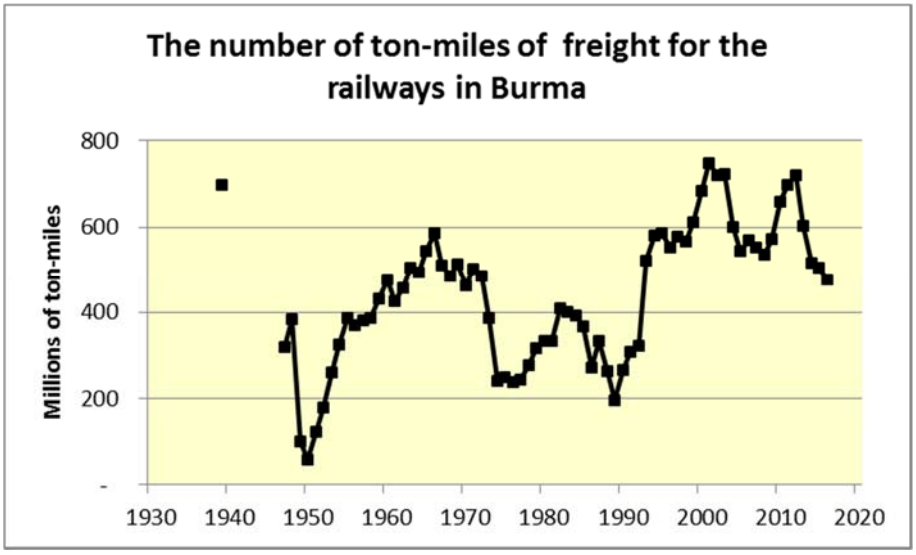

Figure 29: The number of ton-miles of freight for the railways of Burma.

The sharp rise since 2008 can be seen in this graph, with a rise of 35% in freight ton-miles from 535 million ton-miles in 2008 to 722 million ton-miles by 2012. However, this is followed by a sharp fall back to 476 million ton-miles by 2016.

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[138] *The Government of the Republic of the Union of Myanmar*, (2016, December), *op. cit.,* p.473, Table 15.26.

[139] Cook, (1957), *op. cit.,* p.20.

[140] *The Global New Light of Myanmar*, (2016, March 7), "Private freight train services to run between Yangon, Mandalay, Myitkyina". Retrieved from: http://www.burmalibrary.org/docs21/GNLM2016-03-07-red.pdf.

[141] One freight ton-mile is a ton of goods carried a mile.

At 476 million ton-miles, this is at a similar level to fifty years earlier in the early 1960's. The Burmese economy is strengthening as the country moves towards democracy following the release from house arrest of Aung San Suu Kyi in late 2010 and the election of the new NLD government in November 2015. However, it appears from these graphs in Figures 27 and 29 relating to freight that the railways are only playing a small role in this recovery. This is surprising, given that railways should be a key component of a country's infrastructure.

Data for freight are available up until the year ended 31st March 2015, and for freight ton-miles are up until the year ended 31st March 2016.[142] The average distance that freight is transported can be calculated using these two figures, and is shown in Figure 30.

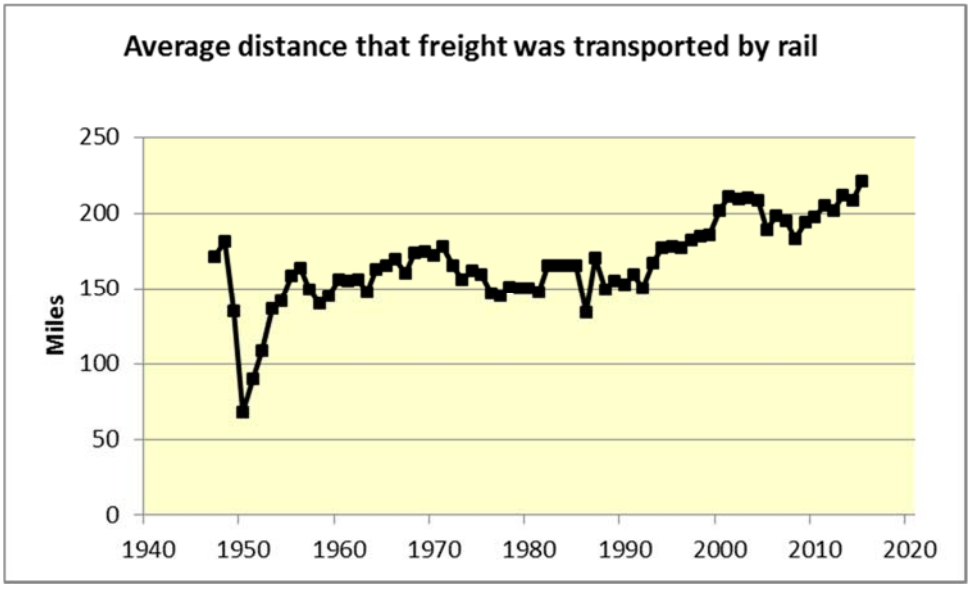

Figure 30: The average distance that freight was transported, 1947-2015.

The average growth rate in freight ton-miles over the 68 years from 1947 to 2015 was 0.68% p.a. The higher growth rate (0.68% for freight ton-miles *vs*. 0.30% for freight) indicates that by 2015 the freight was being hauled longer distances, rising from approximately 150 miles in the late 1950's to 221 miles by 2015.

The ASEAN-Japan Transport Partnership publishes data on rail and other forms of transport in the ASEAN region as well as Japan. In 2012 the average distance of 207 miles for Burma was higher than both Thailand and Malaysia,

[142] The latest statistics for freight are taken from the *Statistical Yearbook 2015.* The latest statistics for freight ton-miles are from the *Selected Monthly Economic Indicators*.

and was similar to the average in the ASEAN region, as can be seen in Table 19.[143]

Country or Region	Freight (000's tons)	Ton-miles (millions)	Average distance transported (miles)
Vietnam	7,076	2,454	347
Burma	3,124	647	207
Indonesia	22	5	206
Malaysia	6,096	956	157
Thailand	11,849	1,607	136
ASEAN	**28,167**	**5,668**	**201**

Table 19: The average distance that freight was transported by rail in the ASEAN region in 2012.

The average distance travelled probably depends on the geography of the country and the location of the central transport hub, which in Burma's case is Yangon. For example, the relatively high number for Vietnam is probably due to the large distance between Hanoi in the north and Ho Chi Minh City in the south, in a country with one very long main line.

3.5.1 Freight Density

Freight density, which is the number of freight ton-miles per mile of route per annum, is defined in a similar manner to passenger density.[144] Data for the period 1960 to 2015 are shown in Figure 31.

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[143] *ASEAN-Japan Transport Partnership,* (2013, December), "ASEAN-JAPAN Transport Statistics Yearbook". Retrieved from: http://www.ajtpweb.org/statistics/compareasean/Rail_Transport/Rail_Transport_2012.

The figures for Burma for freight in tons and ton-miles for 2012 are different to what are reported in a Myanma Railways presentation in February 2013 and in the *Statistical Yearbook 2015* respectively, but result in a similar average distance. See:

Ministry of Rail Transportation, (2013, February 1), *op. cit*.; and

The Government of the Republic of the Union of Myanmar, (2015, December), *op. cit*.

[144] Jones, (1923), *op. cit.*

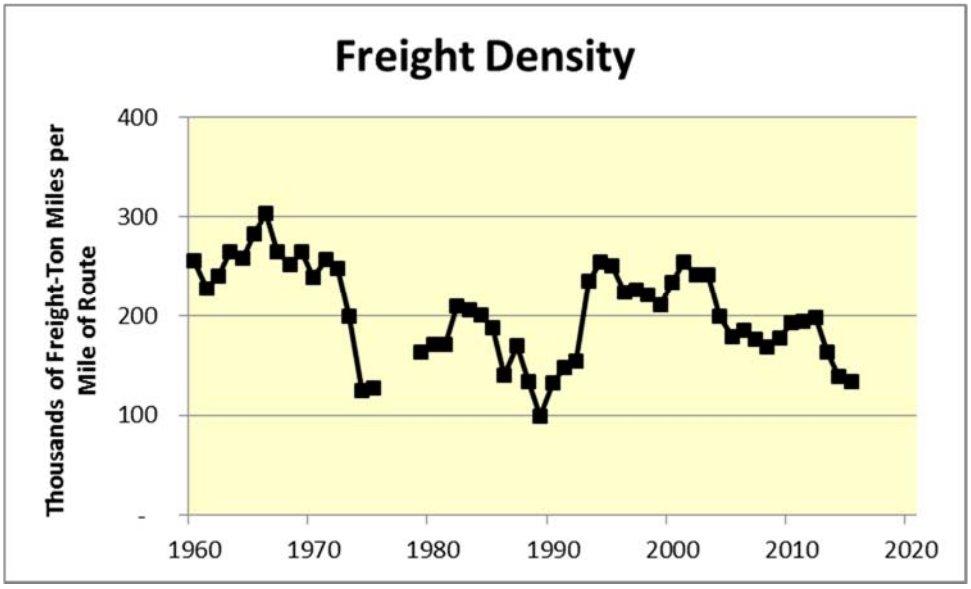

Figure 31: Freight density.

As at 2015, freight density was 133,000 ton-miles per mile of route. This is 48% less than the figure of 256,000 in 1960. This trend is another damning criticism of the performance of Myanma Railways with respect to freight. By contrast, as was seen in Figure 14 above, passenger density rose by 9% for the same period (from 514,000 passengers per mile of route in 1960 to 559,000 by 2015).[145]

3.5.2 Comparing Burma to Other ASEAN Countries

It is useful to compare Burma with other countries in the region. A comparison of the amount of freight transported by rail relative to the size of the population compared to other countries in the ASEAN region in 2012 is shown in Table 20.[146]

Country or Region	Population (Millions)	Freight (000's tons)	Freight per capita (Tons per thousand persons p.a.)
Malaysia	30	6,096	207
Thailand	65	11,849	184
Vietnam	90	7,076	78
Burma	51	3,124	61
Indonesia	245	22	0.1
ASEAN	**615**	**28,167**	**46**

Table 20: Freight transported by rail per capita in the ASEAN region in 2012.

[145] Passenger density reached over 1,400,000 passengers per mile of route in 1987 and again in 1994.

[146] *ASEAN-JAPAN Transport Partnership*, (2013, December), *op. cit*.

The most interesting comparison is with Malaysia, Thailand and Vietnam, as Indonesia has so many islands and is therefore not suited to having a national rail network. Burma is lagging behind all three. The ASEAN-JAPAN Transport Partnership website gives the population for Burma in 2012 as 63.7 million people. The finalised data for the census conducted in Burma in 2014 revealed that the population as at 29th March 2014 was about 51.5 million, a figure which includes an estimate of 1.2 million people for areas not enumerated in Rakhine, Kachin and Kayin States.[147] Accordingly, a figure of 51 million has been assumed in Tables 20 and 21 for the population in 2012.

When one looks at the number of freight wagons in countries in the ASEAN region, Burma is lagging behind Malaysia and Thailand, but is ahead of Vietnam, as can be seen in Table 21.

Country or Region	Population (Millions)	Number of freight wagons	Number of freight wagons per million persons
Malaysia	30	3,002	102
Thailand	65	5,637	87
Burma	51	3,188	63
Vietnam	90	5,332	59
Indonesia	245	3,937	16
Cambodia	15	100	7
Philippines	96	120	1
ASEAN	**615**	**21,316**	**35**

Table 21: The number of freight wagons per million people in the ASEAN region in 2012.

For Burma, the figure quoted for the number of freight wagons is significantly higher than the figure reported in the Statistical Yearbooks.[148] Even using this

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[147] *The New Light of Myanmar*, (2014, August 30), *op. cit.*; and

Sanay Lin, (2014, September 1), "Burma Releases Preliminary Results From First Census in Decades", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/burma/burma-releases-preliminary-results-first-census-decades.html; and

Yen Saning, (2015, May 29), "Final Census Results Released, Sans Ethnic and Religious Data", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/burma/final-census-results-released-sans-ethnic-and-religious-data.html.

[148] The figure for Burma in this table is 3,188 freight wagons which is significantly higher than reported in the *Statistical Yearbook 2011*. It is however consistent with data in a presentation by Myanma Railways in February 2013 and in October 2014, where a figure of 3,326 freight wagons is given for 2012. The October 2014 presentation gives 3,210 freight wagons for 2013 and 3,374 for 2014. See:

Ministry of Rail Transportation, (2013, February 1), *op. cit.*; and

higher figure, Burma is lagging behind ASEAN countries such as Malaysia and Thailand. If one uses the figure of 1,454 freight wagons as reported for 2012 in the *Statistical Yearbook 2011*, the number of freight wagons per million people in the population drops to just 28 freight wagons per persons, significantly lower than Malaysia, Thailand, and Vietnam.[149]

3.5.3 A Comparison of Burma with India and Bangladesh

A comparison with the railways in India and Bangladesh sheds some light on the relative importance in Burma of freight compared to passenger transport in these two neighbouring countries. Table 22 shows data for India for the years 2003-2007, with data being on a per annum basis.[150] This is compared to similar data for Burma for 2015.

	Units	India 2003-2007	Burma 2015
Passengers	Number p.a. (000's)	6,300,000	47,883
Passenger-miles	Passenger-miles p.a. (000's)	429,629,630	2,122,743
Freight ton	Long-ton p.a. (000's)	728,000	2,280
Freight ton-miles	Ton-miles p.a. (000's)	296,913,580	504,759
Average passenger trip	Miles	68	44
Average distance freight was transported	Miles	408	221
(Freight ton-miles) / (Passenger-miles)		69%	24%
(Freight ton) / (Passengers)		11.6%	4.8%

Table 22: Comparison of Burma to India for freight and passengers transported.

India clearly dwarfs Burma with the sheer size of its railway network. However, comparisons can be made. Passengers in Burma travelled on average 44 miles per trip, which is 65% of the average distance travelled in India. In Burma, the average distance freight is transported is 221 miles, which is about half of what it is in India. The more telling results come when we calculate the ratio of (*Freight Ton-Miles*) to (*Passenger-Miles*). For India the figure is 69%, meaning that for

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Ministry of Rail Transportation, (2014, October 13-15), *op. cit*.

These presentations seem to have included four-wheeled freight wagons, most of which have probably been written off. See comments earlier in Footnotes 134 and 135 in this chapter.

[149] By 2015 when the number of freight wagons was reported at 1,811, this figure rises to 35 freight wagons per million people in Burma.

[150] Kumar, Sudhir and Shagun Mehrotra, (2009), "Bankruptcy to Billions. How the Indian Railways Transformed", Oxford University Press, New Delhi, p.149.

each passenger transported one mile there is also 0.69 tons of freight transported. However, for Burma the figure is only 24%, which is approximately one third of what it is in India, suggesting that freight plays a much less significant role in Burma.[151] A similar result occurs if we calculate the ratio of (*Tons of Freight)* compared to (*Passenger Numbers)*. For India this ratio is 11.6%, meaning that for every 100 passengers transported 11.6 tons of freight is carried. For Burma the result is 4.8%, which is under half of what it is for India. This also suggests that freight is less significant in Burma than in a comparable country such as India. Similar results are achieved if one compares the 2003-2007 data for India to Burma for the same five-year period, as can be seen in Table 23.

	Units	India 2003-2007	Burma 2003-2007
Passengers	Number p.a. (000's)	6,300,000	63,726
Passenger-miles	Passenger-miles p.a. (000's)	429,629,630	2,895,226
Freight ton	Long-ton p.a. (000's)	728,000	2,980
Freight ton-miles	Ton-miles p.a. (000's)	296,913,580	597,673
Average passenger trip	Miles	68	45
Average distance freight was transported	Miles	408	201
(Freight ton-miles) / (Passenger-miles)		69%	21%
(Freight ton) / (Passengers)		11.6%	4.7%

Table 23: Comparison of the railways of India and Burma for the years 2003 to 2007.

A comparison with Bangladesh gives similar results. The data below are for 2007, at a time when Bangladesh's population was 144 million people, and the length of its railway routes was 1,762 miles.[152] This compares to Burma's population of about 50 million people and route length of 3,119 miles in 2007.[153] Table 24 shows passenger numbers and freight for Bangladesh and Burma.

[151] A key cause of the difference is the quality and gauge of the track. India's railways are predominantly broad gauge, which is much more suitable for goods trains than Burma's metre gauge.

[152] *World Bank*, (2008), "Bangladesh: Transport at a Glance, 2007". Retrieved from: http://siteresources.worldbank.org/INTSARREGTOPTRANSPORT/1812598-1130163703703/21884323/Bangladesh_Transport_At_Glance_2007_update_2008.pdf.

[153] The figure of 50 million is a simple estimate based on the census figure of 51.4 million in August 2013.

	Units	Bangladesh	Burma
Passengers transported annually by rail	Million	45	73
Freight transported annually by rail	Million tons	3.0	2.8
Passengers transported annually by rail	Per capita	0.31	1.45
Freight transported annually by rail	Tons per capita	0.02	0.06

Table 24: Passenger numbers and freight for Bangladesh and Burma in 2007.

The figures in the last two rows of this table are normalised for the population of each country. On a per capita basis, the figures for the performance of the railways in Burma are significantly higher than the similar figures for Bangladesh.

However, if one examines passenger and freight density, as shown in Table 25, a different picture emerges. Bangladesh has a significantly higher result for both passenger density and freight density.

	Units	Bangladesh	Burma	Ratio of Burma to Bangladesh
Railway Traffic Density of Passenger	(Passenger-Miles) / (Rail route mile) p.a.	9,753	2,007	21%
Railway Traffic Density of Freight	(Ton-Miles) / (Rail route mile) p.a.	660	177	27%
Passengers transported annually by rail	Million	45	73	163%
Freight transported annually by rail	Million tons	3.01	2.82	94%
(Freight ton) / (Passengers)		6.8%	3.9%	

Table 25: Comparison of Burma and Bangladesh for 2007.

Even though Burma's population is smaller, the density of passenger traffic (measured in terms of the number of passenger-miles per mile of route in the year) is only 21% of what it is for Bangladesh. Similarly, when examining freight density (measured by the number of ton-miles per mile of route per year) it is only 27% for Burma relative to Bangladesh. The railways in Burma transported about 1.6 times the number of passengers compared to Bangladesh. However when one looks at freight, the railways in Burma transported 6% less freight than was transported by rail in Bangladesh (2.82 million tons p.a. for Burma *vs*. 3.01 million tons for Bangladesh). This suggests that freight is of less importance relative to passenger traffic in Burma compared to Bangladesh. If one employs the same metric used when doing the comparison with India, the ratio of (*Tons of Freight*) compared to (*Passenger Numbers*) is 6.8% for Bangladesh but only 3.9% for Burma. The figures for the three countries are summarised in Table 26.

Country	Year	(Freight tons) / (Passengers)
India	2003-2007	11.6%
Bangladesh	2007	6.8%
Burma	2007	3.9%

Table 26: (Freight tons) / (Passengers) for India, Bangladesh and Burma.

3.5.4 Observations in Burma

The conclusions after comparing Burma with India and Bangladesh are consistent with my own observations that the transport of freight is not a key element of the railways in Burma. The total amount of freight transported in 2015 was 2.28 million tons. The *Statistical Yearbook 2015* breaks the freight down into 37 different commodities transported by rail, ranging from rice to firewood. The eight largest groups (as measured by tons) in 2015 are shown in Table 27.[154]

Commodity	Ton (000's)	As a % of Total
Railway Departmental	663	29.1%
Stone and ballast	151	6.6%
Timber	131	5.7%
Provisions	98	4.3%
Manures	97	4.3%
Petroleum and other hydrocarbon oils	91	4.0%
Military accoutrements and stores	85	3.7%
Rice	38	1.7%
Other categories (including Miscellaneous)	926	40.6%
Total	**2,280**	**100.0%**

Table 27: The eight largest groups of commodities transported by rail in 2015, as measured by tons.

A similar ranking occurs when one looks at ton-miles as a measure of importance of each commodity, as can be seen in Table 28 below.

[154] *The Government of the Republic of the Union of Myanmar*, (2015, December), *op. cit.*, Table 15.08, pp.408-411.

Commodity	Ton-Miles (Millions)	As a % of Total
Railway Departmental	48	9.3%
Stone and ballast	43	8.3%
Provisions	39	7.5%
Manures	37	7.2%
Timber	36	6.9%
Petroleum and other hydrocarbon oils	30	5.8%
Military accoutrements and stores	22	4.3%
Iron and steel	22	4.2%
Other categories (including Miscellaneous)	240	46.5%
Total	**517**	**100.0%**

Table 28: The eight largest groups of commodities transported by rail in 2015, as measured by ton-miles.

There are many more passenger trains than goods trains on the network in Burma. A goods train on the Mandalay-Lashio line is shown in Plate 27.

Plate 27: A goods train at Hsipaw Station bound for Lashio.

This train consisted of just eight freight wagons. The wagons covered in blue tarpaulins may have been carrying supplies for the military who have a regional command centre in Lashio. In most cases the goods trains in Burma are not as long as the ones in Australia, for example, which would have a major impact on the amount of freight transported each year.[155]

The new Hinthada-Yangon line, which was opened in May 2014, should have provided a valuable freight route for the transport of freight from the west

[155] Certainly the goods trains on the branch lines are short. However, on a fieldwork trip to Burma in January and February 2017 I did notice some long goods trains on the main line from Yangon to Mandalay.

bank of the Irrawaddy River to Yangon, but unfortunately this line is now closed.[156] There is a new line under construction from Sittwe in Rakhine State to Ann, which will then link to Minbu on the Kyangin-Pakokku line.[157] However transporting freight by rail from Minbu to Yangon would not be easy.

What is common in Burma on the branch lines is to have mixed passenger/goods trains. For example, on rural lines such as the Mandalay-Lashio line, the Ye-Dawei line, and the Aungban-Loikaw line there may be two to six passenger coaches and one or two goods vans at the rear of the train. This is illustrated in Plates 28 and 29.

Plate 28: A mixed passenger/goods train at Pinlaung Station, on the Loikaw to Aungban line.

[156] Aye Min Soe, (2014, May 25), *op. cit.*

See also Footnote 26 in this chapter.

[157] Aye Min Soe, (2014, May 25), *op. cit.*

Plate 29: A passenger train with two goods vans at the rear, at Kyaukme Station on the Mandalay-Lashio line.

The key consequence of combining a passenger service with a freight service is to make for a very slow trip. The trains will stop for say fifteen minutes at small stations to unload goods from the goods vans and to load goods on. Often the goods being transported are locally produced agricultural products. An example is shown in Plate 30, where the train stopped for eleven minutes while bags of potatoes were loaded at the rear of the train.

Plate 30: Loading the goods vans at Taung Tayar Station on the Aungban-Loikaw line.

This trip from Aungban to Loikaw was only 102 miles but took over eleven hours, due in part to the long stops loading and unloading the two goods vans at the

rear of the train. A case study of this line is included in Chapter 6 of this thesis. A second example of a mixed passenger/goods train is shown in Plate 31.

Plate 31: Loading bundles of bamboo strips onto the goods wagons at the rear of a passenger train at Haung Hkio Station on the Mandalay-Lashio line.

Huang Hkio is a major stop on the Mandalay-Lashio line, and during a lengthy stop, bundles of bamboo strips were loaded into the goods vans at the rear of the train. Often the goods carried are of low value: e.g. bundles of empty sacks, bamboo strips, potatoes. Even though the operation of mixed passenger/goods trains make for slow trips, it is providing the type of service that the rural community needs. Often the trains on the branch lines are quite short, with three or four passenger coaches and one or two goods vans. A typical small mixed passenger/goods train on the Ye-Dawei line is shown in Plate 32, and is similar to the one on the Aungban-Loikaw line shown in Plate 28 above.

Plate 32: A small mixed passenger/goods train, on the line between Ye and Dawei.

On the Ye-Dawei line there is just one train in each direction per day. Trains such as this provide a valuable service to the community by not only transporting passengers, but by also delivering freight to the towns and enabling farmers to get their produce to market. Older lines, such as the Ye to Dawei line, are not suitable for large fast-travelling goods trains. The line is old, many of the sleepers are wooden, and often the track is overgrown by weeds. This is illustrated in Plate 33.[158]

[158] This photograph was taken south of Nat Kyee Sip, with lush tropical vegetation on either side of the track. The train was travelling at about 15 miles/hour.

Plate 33: The line from Ye to Dawei, with the track overgrown with weeds.

The branch lines are particularly bad in quality. The Yangon-Moulmein line is not a branch line, but the track is poor due to poor ballasting and the train bounces badly due to the poor track. On the line on the west bank of the Irrawaddy River, the line is covered in dried mud and sand at many places and the train needs to travel quite slowly. At times the rails are barely visible, as can be seen in Plate 34.[159]

Plate 34: The line between Pakokku and Seikphyu, covered with dried mud and sand.

[159] This photograph was taken on the line south of Kyun Chaung, on 14th January 2013.

The branch lines are in poor condition and are hardly suited to heavy goods trains. Indeed, it is surprising that goods trains such as the one shown at Hsipaw in Plate 27 make it to their destination of Lashio at the end of the line, so bad is the track between Hsipaw and Lashio with jungle encroaching right up to the line. One reason for the poor quality of track is the way the sleepers are laid. For example, the track in Plate 3 at Mye Chit Station shows sleepers quite close together and supported with an ample amount of ballast. By contrast, at Dama Thaw station shown in Plates 5 and 6 the sleepers are much further apart and there is hardly any ballast. This is also the case for the track at Kyauk Ta Lone Station shown in Plate 7. Kyauk Ta Lone is on the Ye to Dawei line. Such lines are not suitable for heavy goods trains.

One role played by the railways is the transport of military equipment and supplies. As is shown in Table 27 above, military accoutrements and stores make up about 3.7% of total freight transported by rail. It is probable that ammunition is included in the freight transported for the military. For example, a goods train was derailed when the Kachin Independence Army (KIA) set explosives to derail a train on the Mandalay-Myitkyina line in December 2012.[160] The KIA claimed the train was carrying ammunition; the government said it was not. This was not a one-off incident: according to the government, there were forty-nine blasts by the KIA on the railways in 2011 and 2012.[161] This particular train had only seven freight wagons (similar to the goods train at Hsipaw Station shown in Plate 7 above). As discussed in §3.4.1 of this chapter, in May 2017 China donated two trains to Burma's Armed Forces: one passenger train and one goods train.[162] The goods train is made up of a 2,000-horsepower locomotive and ten covered freight wagons with a capacity of 32 tons each. This provides the military with dedicated goods train for its own use.

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[160] *The New Light of Myanmar*, (2012, December 26), "Cooperation with understanding of genuine goodwill needed". Retrieved from: http://www.burmalibrary.org/docs14/NLM2012-12-26.pdf.

[161] *Ibid*.

[162] *The Global New Light of Myanmar*, (2017, May 27), *op. cit*.; and

Ding Xiaoxiao, (2017, May 27), *op. cit.*

3.6 The Components of Revenue: Freight *versus* Passengers

The contribution of revenue from transporting goods relative to the revenue from transporting passengers has changed dramatically over the last sixty years. In the 1950's up until the mid-1960's, more revenue came from freight rather than passengers. This is shown in Figure 32.

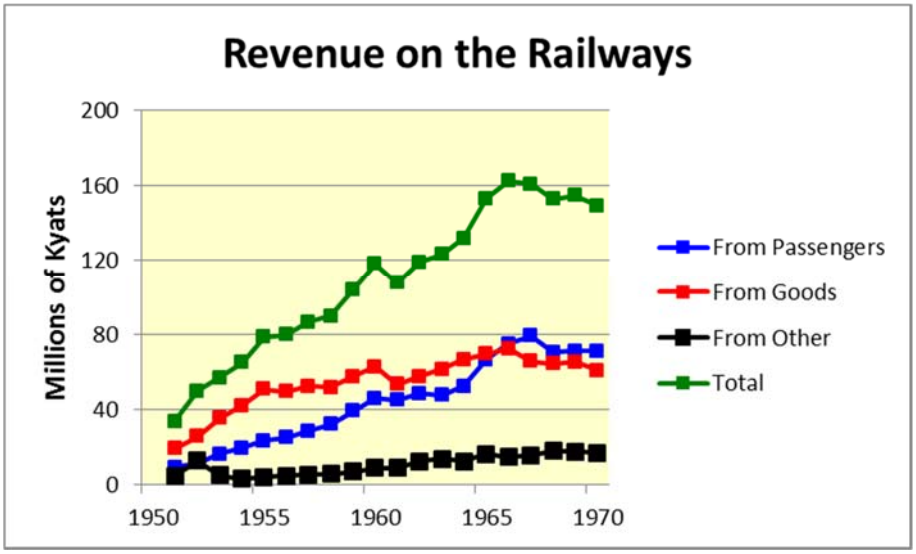

Figure 32: Revenue on the railways from 1950 to 1970.

In 1951 57% of revenue came from transporting goods, with only 28% from transporting passengers. The remaining 15% was from other sources.[163] By 1970 41% came from transporting goods, 48% from transporting passengers, with the balance of 11% being from other sources. This is shown in Figure 33.

[163] The data on freight in the Statistical Yearbooks include all goods except mail, passengers' baggage and carriers' store. Some of the revenue listed as "Other" would be derived from transporting mail. See:

The Government of the Republic of the Union of Myanmar, (2012, November), "Statistical Yearbook 2011", Central Statistical Organization, Ministry of National Planning and Economic Development, Nay Pyi Taw, p.351.

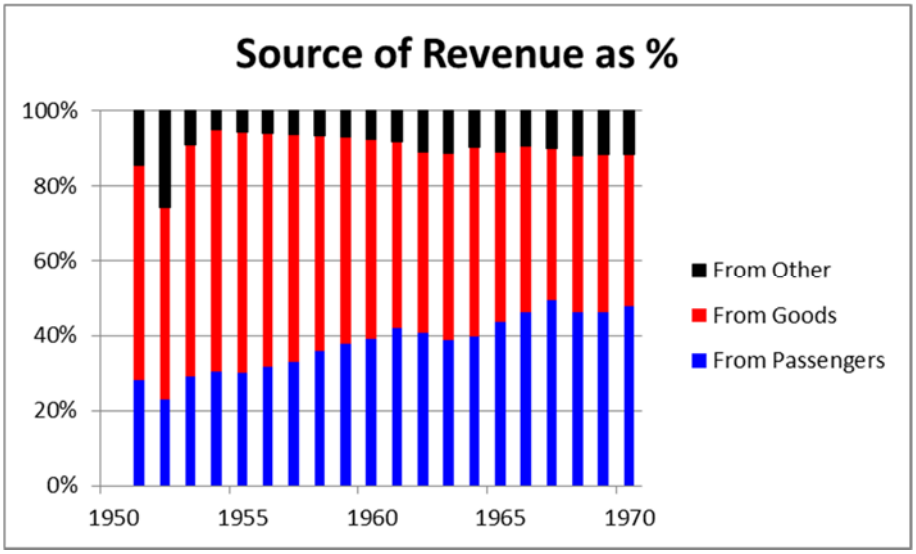

Figure 33: Sources of revenue on the railways in the 1950's and 1960's.

By 2015 the picture was very different. Total revenue was over 3.4 billion kyats, with 60.4% from passengers and only 30.3% from the transport of goods, with the balance of 9.3% from other sources. The shift towards revenue from passengers can be seen in Figure 34.

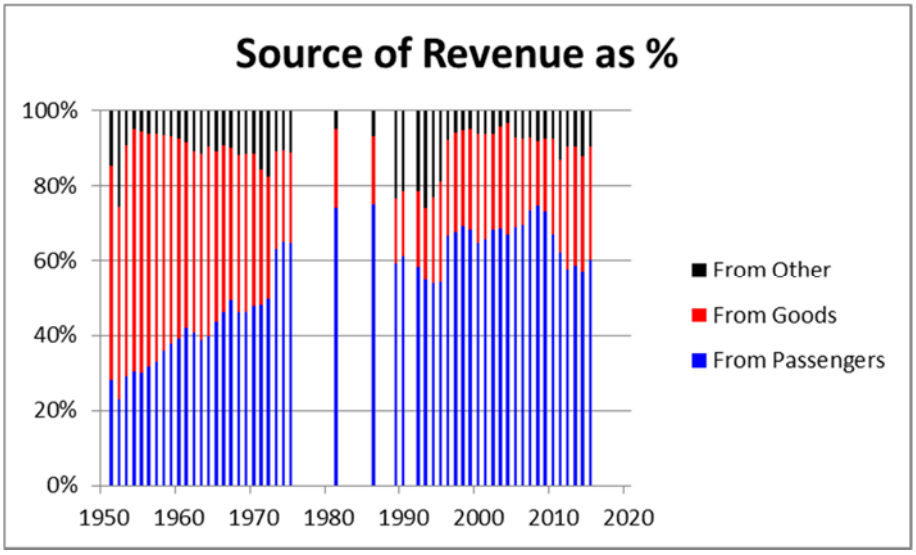

Figure 34: Sources of revenue on the railways from 1951 to 2015.

These changes are summarised in Table 29

Source of revenue	1951 Millions of Kyats	1951 %	2015 Millions of Kyats	2015 %
Passengers	9.5	28%	3,417	60%
Goods	19.5	57%	1,715	30%
Other	4.9	15%	529	9%
Total revenue	**33.9**	**100%**	**5,660**	**100%**

Table 29: Sources of revenue for the railways in 1951 and 2015.

No information is available on the profitability of goods *versus* passengers, but the above results do suggest that Myanma Railways has let its freight business slip. In India, approximately 30% of revenue is sourced from passengers and 70% from transporting freight, as can be seen in Figure 35.[164]

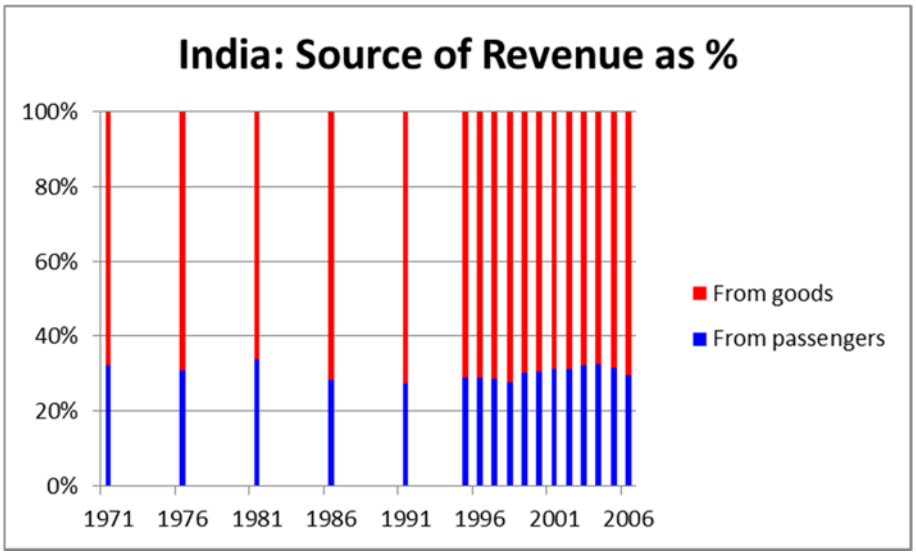

Figure 35: The sources of revenue on the Indian Railways.

This contrast between India and Burma further reinforces the conclusion that the freight operations of Myanma Railways have been neglected.

3.7 Comparison with the Inland Waterways

The inland waterways in Burma were important for both the transport of passengers and freight for many decades, but are now becoming less important. The operations of the government-owned Inland Water Transport have declined dramatically over the last few years, but the private sector operations are still important. Statistical data are only available for the government sector. The number of passengers travelling on the inland waterways on vessels operated by the government's Inland Water Transport is less than for the railways, but grew at a much quicker rate than for railways for the period 1962 to 2011, but has fallen sharply since 2011.[165] The inland waterways grew at an average rate of 3.4% p.a.

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[164] *Indian Railways Fan Club* website, "Railway Traffic and Freight Earnings 1970-71 to 2005-06". Retrieved from: http://www.irfca.org/docs/stats/stats-performance-ir.html.

[165] When I was in Burma in January 2016 I travelled by rail to Pyay (formerly Prome), and while there I called into the Inland Water Transport (IWT) office which is near the Irrawaddy River. The manager indicated there had been no IWT passenger vessels from Pyay to Yangon for two years, nor for that matter any IWT cargo vessels. Prome was a key port for the Irrawaddy Flotilla Company (IFC), with the Rangoon-Prome railway line which was built in 1877 enabling passengers to travel by train from Rangoon to Prome and then connect to an IFC vessel to sail north up the Irrawaddy. It is indicative of the decline in Inland Water Transport that

for the 1962-2011 period compared to just 0.9% p.a. for the railways, as shown in Table 30.

Passenger numbers	Unit	1962	2011	Growth (%)	Growth (% p.a.)
Railways	Millions	43.1	67.7	57%	0.9%
Inland waterways	Millions	5.3	27.6	424%	3.4%

Table 30: The change in passenger numbers between 1962 and 2011.

The year 1962 is chosen as this was the year of the military coup lead by General Ne Win. Looking at the period 1962 to 2015 (i.e. taking into account the recent declines in both passenger numbers on the railways and inland waterways), growth is only 0.22% - 0.23% per annum over the 53 year period (or total growth of 11% - 12%). This lack of growth is indicative of neglect by government, but also a changing society (eager to get from one place to the other more quickly).

Passenger numbers	Unit	1962	2015	Growth (%)	Growth (% p.a.)
Railways	Millions	43.1	47.9	11.2%	0.22%
Inland waterways	Millions	11.0	12.3	11.9%	0.23%

Table 31: The change in passenger numbers between 1962 and 2015.

The figures for the inland waterways are shown in Figure 36.

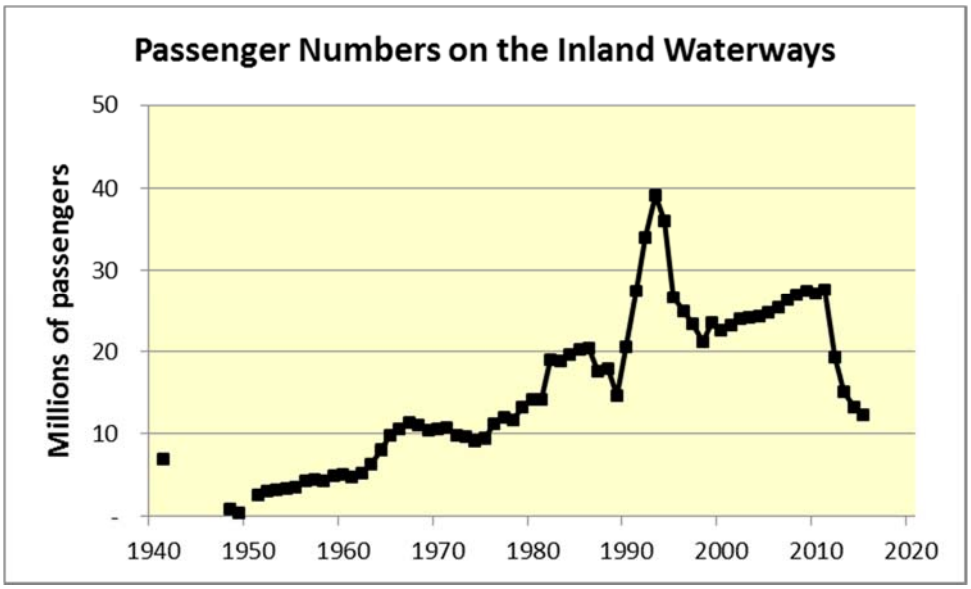

Figure 36: Passenger numbers on the inland waterways.

Pyay, formerly a very important river port, sees no traffic from IWT. There were private vessels passing and docking at Pyay while I was there, but no IWT ones.

The Irrawaddy Flotilla Co. fleet was scuttled by the British after the Japanese invasion of Burma in World War II.[166] The number of passengers recorded for 1949 was a mere 400,000. A comparison between the railways and the inland waterways shows that passenger numbers have fallen in recent years. The number of passengers on the railways has been declining since 2008, and on the inland waterways the numbers have fallen sharply since 2011, as can be seen in Figure 37.

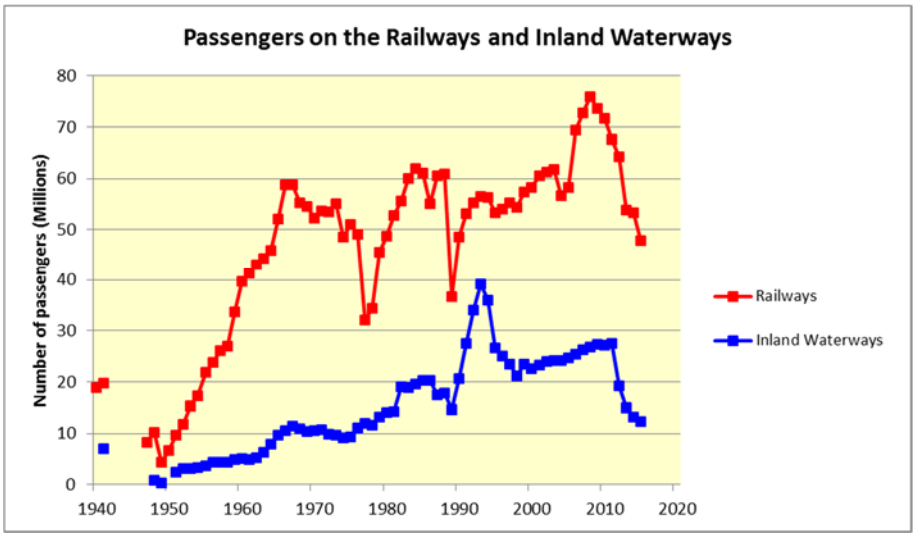

Figure 37: Passenger numbers on the railways compared to the inland waterways.

Interestingly the inland waterways were performing strongly in the early 1990's compared to the railways, with passenger numbers reaching 69% relative to rail in 1993, before falling back to just 26% by 2015.

The relative performance of the railways compared to the inland waterways is shown in Figure 38, where the year 1951 is indexed to 100.

[166] McCrae, Alister and Alan Prentice, (1978), "Irrawaddy Flotilla", James Paton Limited, Paisley, United Kingdom, pp.132-147; and

Chubb, H.J. and C.L.D. Duckworth, (1973), "The Irrawaddy Flotilla Company, 1865-1950", National Maritime Museum, London, pp.63-76.

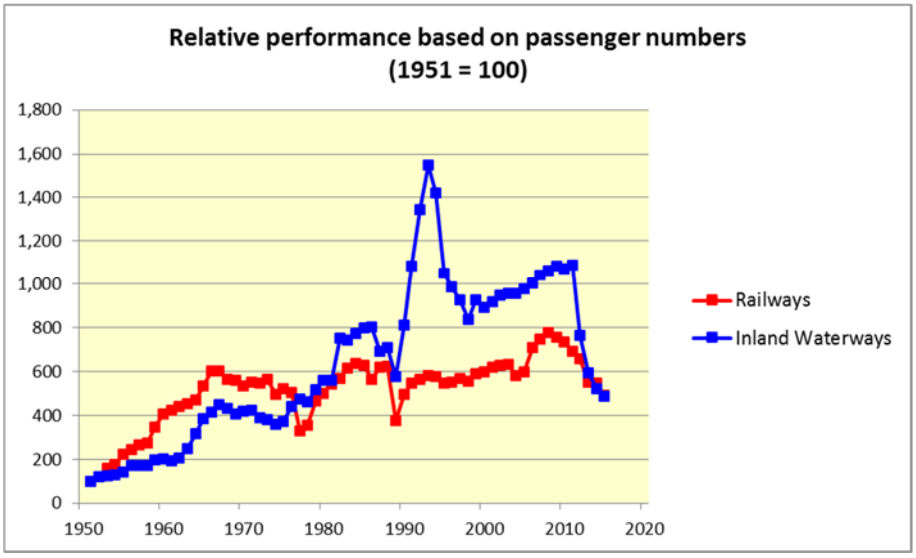

Figure 38: The relative performance of the railways and the inland waterways.

These data are shown in a different manner in Figure 39.

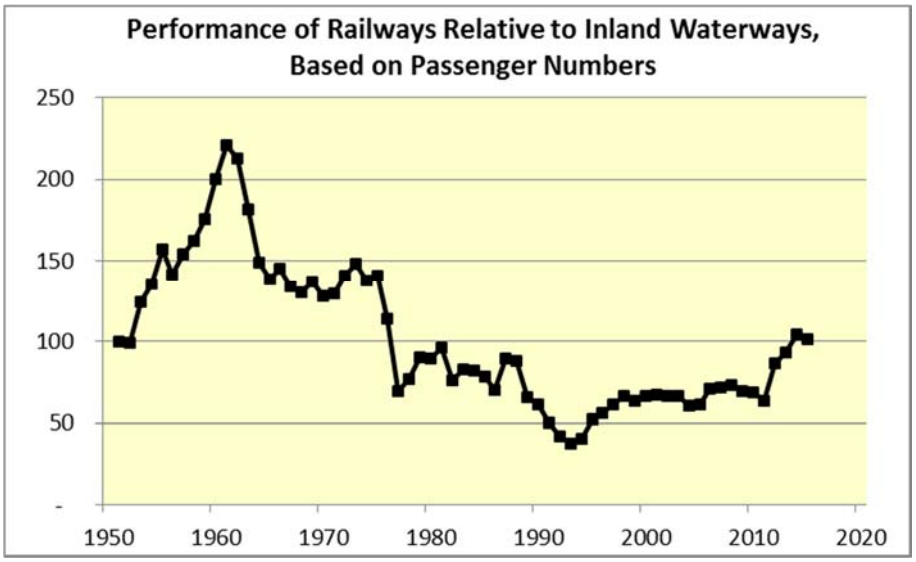

Figure 39: The performance of the railways relative to the inland waterways based on passenger numbers.

In this graph, the number of passengers on the railways is divided by the number of passengers on the inland waterways, and is indexed to 100 for the year 1951.[167] If the line rises, the railways are outperforming the inland waterways in terms of growth in passenger numbers, and if the line falls the inland waterways are performing better. This graph goes to 2015. The railways were clearly growing at a stronger rate from 1951 to 1961, but following the military takeover by General Ne Win in March 1962 the railways underperformed the inland waterways

[167] The choice of the year 1951 is not an issue. It is chosen as the first year after Independence from which there is continuous data for both modes of transport. By dividing the number of passengers on the railways by the number of passengers on the waterways, the starting date is irrelevant.

significantly, until the recent slump by the inland waterways after 2011. The possible explanation of the long-term underperformance of the railways is that the railways were not properly maintained under the military government: both the track and the rolling stock were poorly maintained. For the inland waterways, little expenditure (other than dredging) was needed to maintain the waterways. The only issue was the maintenance of the fleet of vessels.

The passenger-miles on the inland waterways averaged 393 million p.a. for the period 1962-2016, but by 2016 it was only 54 million passenger-miles compared to 147 million passenger-miles in 1962. Up until 2009 the growth was strong, being 3.6% p.a. for the period 1962-2009. The data for passenger-miles are shown in Figure 40.

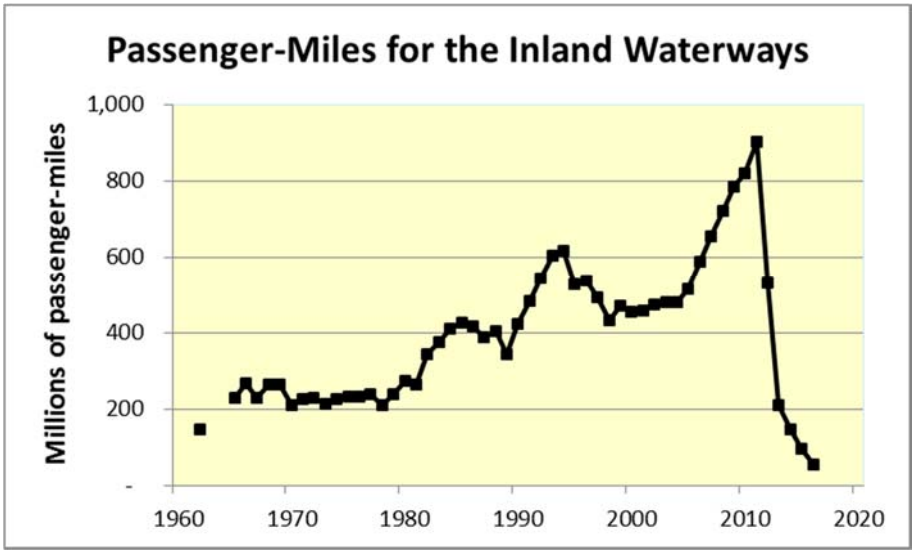

Figure 40: Passenger-miles on the inland waterways.

There is a massive fall in passenger-miles from 2011 to 2015. Certainly, passenger numbers and passenger-miles on the inland waterways are declining, but whether it has been this severe or whether the statistics are being measured in a different manner is unclear.[168]

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[168] The figures for 2011 to 2015 are from the *Statistical Yearbook 2015* published by the Central Statistical Organization which is a part of the Ministry of Planning and Finance. The figures for 2012 and 2013 are the same as those in a presentation in March 2014 by Inland Water Transport. See:

Inland Water Transport, (2014, March 7), "Current Status on River Transport and Challenges in Myanmar". A presentation at the Seminar for Promoting Inland Water Transport in Myanmar held in Yangon on 7th March 2014. Retrieved from: http://www.jterc.or.jp/english/kokusai/conferences/pdf/140307_presentation-02.pdf.

The new NLD government appears to be aware of the importance of having accurate statistics recorded, and has set up a Committee for the Collection of Precise and Quality Statistics, with the Vice President Henry Van Thio being involved. See:

The average trip size was just 32.7 miles by 2011, only marginally higher than the average of 28.0 miles in 1962. But the average distance has been increasing steadily from the figure of 19.8 miles p.a. in 2004, until a sharp fall after 2011. Average distance travelled on the inland waterways is shown in Figure 41.

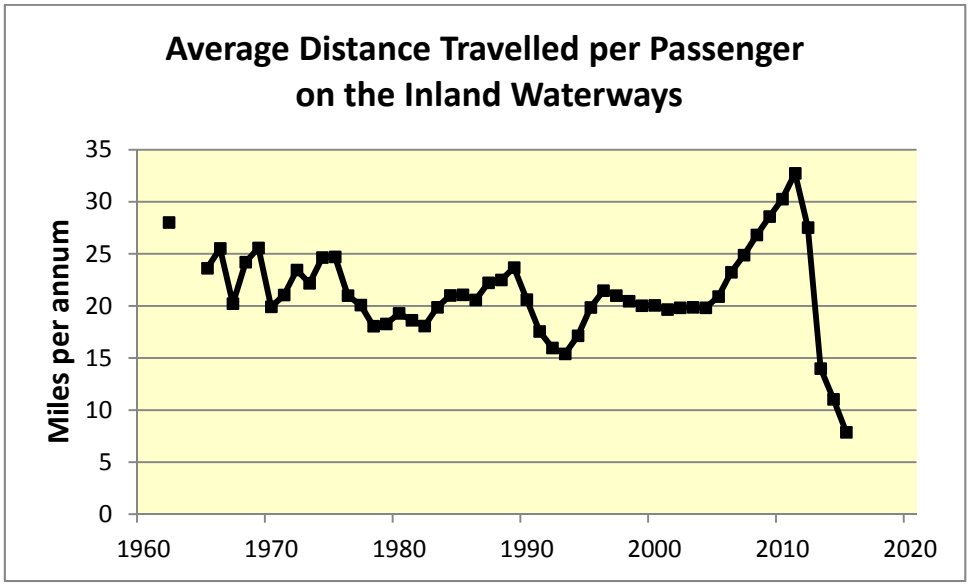

Figure 41: Average distance travelled per passenger per annum on the inland waterways.

The amount of passenger-miles for the inland waterways compared to the railways is quite small, with passenger-miles on the inland waterways being about 5% of the passenger-miles on the railways by 2016, compared to 20% a decade earlier. There has probably been a shift to privately operated vessels on the inland waterways.[169] Data for passenger-miles are shown in Figure 42.

The Global New Light of Myanmar, (2016, November 30), "Precise statistics are invaluable: Vice President U Henry Van Thio". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2016-11-30-red.pdf; and

The Global New Light of Myanmar, (2017, May 19), "Meeting for accurate statistics held". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-05-19-red.pdf.

[169] For example, when I travelled from Myitkyina to Mandalay on the Irrawaddy River in January 2010 and from Monywa to Homalin on the Chindwin River in December 2013, all the vessels I travelled on were privately operated.

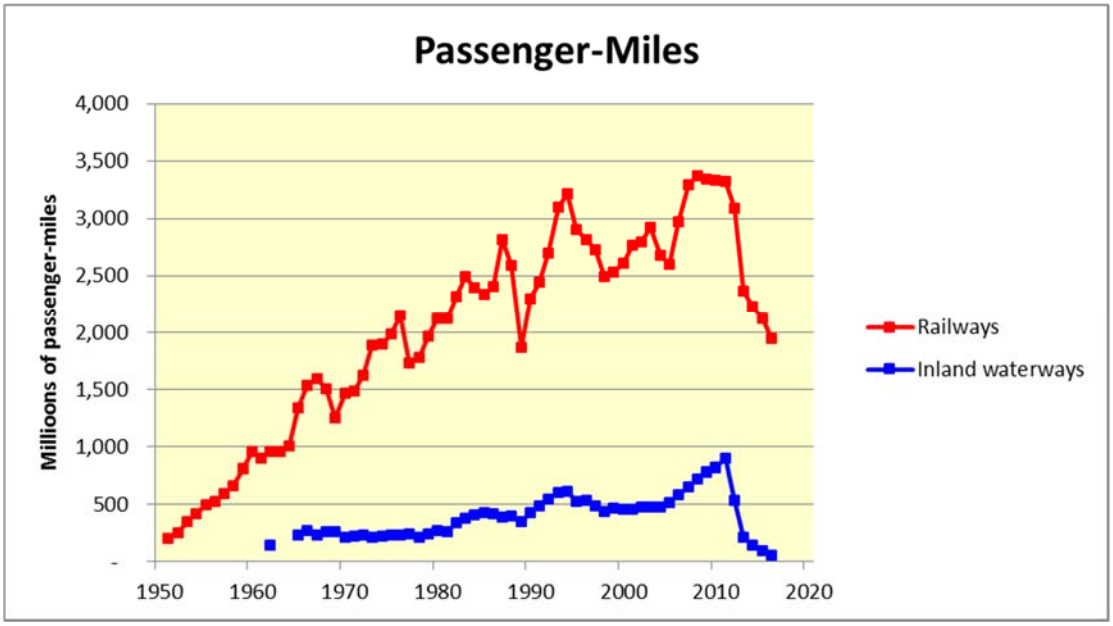

Figure 42: Passenger-miles for the railways and the inland waterways.

The relative growth figures for the railways and the inland waterways for the period 1962-2011 and also for 1962-2015 are summarised in Table 32.

	1962	2011	2015	Change 1962-2011	Change 1962-2015
Railways					
Passenger numbers (000's)	43,078	67,650	47,883	57%	11%
Passenger-miles (000's)	953,132	3,328,720	2,122,743	249%	123%
Average distance travelled p.a. (miles)	22	49	44	122%	100%
Inland Waterways					
Passenger numbers (000's)	5,260	27,565	12,287	424%	134%
Passenger-miles (000's)	147,292	902,208	96,651	513%	-34%
Average distance travelled p.a. (miles)	28	33	8	17%	-72%

Table 32: Passenger numbers and passenger-miles on the railways and inland waterways.

The conclusions to draw from the above data are:

- The railways remain an important component of the transport system within Burma.
- Travel on government-owned vessels on the inland waterways has fallen significantly since 2011. Twelve million passengers were still being transported annually in 2015, but this is less than half of what it was in 2011.
- The railways are carrying more passengers than the inland waterways (47.9 million p.a. compared to 12.8 million p.a. in 2015). The railways are also higher on the passenger-miles front (2,123 million for the railways

compared to 97 million for the inland waterways in 2015). Figures for both the railways and the inland waterways have fallen dramatically since 2011. There are no private railways and all passengers are travelling on the government-operated railway system, and so all railway passengers are included in the railways data. There are a couple of private freight lines, such as the electric railway at the cement mill at Kyangin[170] (see Plate 56 in Chapter 5) and the line to the Bawdwin Mines at Namtu in Shan State.[171] However for the inland waterways, information is available for the government-operated Inland Water Transport vessels, but not for the many privately-owned passenger craft on the rivers. One possible partial explanation for the decline in the reported passenger numbers on the inland

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[170] *Japan International Cooperation Agency*, (2002, October), "Kyangin Cement Mill Transportation Reinforcement Project". Retrieved from: http://www.jica.go.jp/english/our_work/evaluation/oda_loan/post/2002/pdf/071_full.pdf.

I passed by the cement mill on 30th December 2013, but there was no sign that the electric trains were operating. This was when I was travelling by bus bewteen Phayabaw and Kyangin, as the railway line was blocked. I had travelled by train between Phayabaw and Kyangin eleven months earlier on 16th January 2013 and the RBE driver had commented that the electric line was not being used.

[171] Darvill, Simon, (2013), "Industrial Railways and Locomotives of India and South Asia", Industrial Railway Society, Leicestershire, United Kingdom, pp.434-438; and

TraveltoMyanmar website, "Myanmar Mines Railway in Namtu". Retrieved from: http://www.traveltomyanmar.com/myanmar_mines.htm; and

Seiler, (2013), *op. cit*.; and

Bond, F.S., (1941, March), "The Railway Section of the Burma Trade Route", The Railway Magazine, Vol. 87, January to December 1941, London, pp.120-124. See the discussion on p.123 of the 2 *ft*. gauge line at Namtu, which was 50 miles long, and at the time of writing in the 1940's, partly electrified; and

The International Steam Pages, "The Burma Mines Railway 1999", *International Steam* website. Retrieved from: http://www.internationalsteam.co.uk/trains/bmines.htm; and

Ballantyne, Hugh, (2000, January), "Steam in Cambodia and Myanmar, January 2000", The International Steam Pages. Retrieved from: http://www.internationalsteam.co.uk/trains/cambod05.htm. See the section entitled *"No.1 Mining Enterprise – Namtu-Bawdwin Mine (Burma Mines Railway"*; and

The International Steam Pages, "The Burma Mines Railway, February 2006", *International Steam* website. Retrieved from: http://www.internationalsteam.co.uk/trains/burma15.htm; and

Anonymous, (2011, November 28), "Namtu-Bawdwin Railtruck. Wallah Gorge to Namtu", a video recording on YouTube. Retrieved from: https://www.youtube.com/watch?v=3502lHaZQIo; and

Yun Pia, (2015, July 4), "Exploring Shan State's Forgotten Mines", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/factiva/exploring-shan-states-forgotten-mines.html; and

Marshall, Lawrence G. and John Phillips, (2003, August/September), "Myanmar Mines", Narrow Gauge World, Volume 28, pp.30-34; and

Rainbow, Julian, (2000, Spring), "Burma Mines Railway", The British Overseas Railways Journal, No. 20, pp.132-133; and

French, Philip, (2000, Autumn), "Burma Mines Railways Track Diagrams", The British Overseas Railways Journal, No. 21, pp.145-147; and

French, Philip, (2001, Spring), "Burma Mines Railways Track Diagrams", The British Overseas Railways Journal, No. 22, p.162; and

French, Philip, (2001, Autumn), "Burma Mines Railways Track Diagrams", The British Overseas Railways Journal, No. 23, p.183.

waterways is corruption. There are reports of vessels leaving their destination, and then calling in further along the river to take on passengers whose fares are not going to the Inland Water Transport and are therefore not shown in the statistics. But I suspect this practice is not new. A more likely explanation is the competition from buses, which are quicker than going by river and much more modern. Another factor is the number of new bridges being constructed throughout the country, making it easier and quicker for people to travel by road.[172]

The railways and inland waterways are usually not competing against each other for passengers. In several areas of Burma there is no rail service, but there is a waterborne service provided by Inland Water Transport and private operators. Examples are the towns and villages on the Chindwin River; towns and villages on the Irrawaddy River between Myitkyina and Mandalay (only Katha is serviced by rail); and locations in Rakhine State such as Mrauk U. A report prepared by the World Bank in 1956 noted that:[173]

> *River transport is important and partly competitive, but mainly serves districts outside the Railway zone.*

Another report in 1973 by the World Bank on the inland water transport system stressed how the railways and inland water transport complement each other.[174]

> *The transport system of the country is dominated by inland water transport and the railway, both serving the key economic centers of Burma but traversing different terrain in doing so. These two major systems, of which inland water transport is the larger, complement each other rather than compete for traffic.*

Often the two services complement each other. On the west bank of the Irrawaddy, the line runs from Pakokku in the north to Hinthada in the south.[175] At

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[172] This reason has appeared in recent editions of the government publication *Selected Monthly Economic Indicators*. See:

Central Statistical Organization website, *op. cit*.

[173] *International Bank for Reconstruction and Development*, (1956, April 27), "Appraisal of Burma Railway Rehabilitation Program", Report No. T.O. 106-b, p.3. Retrieved from: http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2002/09/12/000178830_98101903451010/Rendered/PDF/multi0page.pdf.

[174] *International Bank for Reconstruction and Development*, (1973, May 31), "Appraisal of an Inland Water Transport Project, Burma", Report No. 171-BA, p.i. Retrieved from: http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2000/12/13/000178830_98101912211651/Rendered/PDF/multi_page.pdf.

[175] At present the line is not operating between Seikphyu and Minbu, nor between Thayet and Kyangin. The latter section was blocked between Phayabaw and Kyangin by a landslide in mid-2013 and this had not been cleared as at December 2013. The Thayet-Kyangin line was closed when I visited the region in January 2017.

Hinthada the Irrawaddy River is very wide. To travel from Hinthada to Yangon by train it is necessary to take a ferry upriver to Tharrawaw on the opposite bank of the river, a trip of about 1 hour 40 minutes. The station at Tharrawaw is just a few minutes' walk from where the ferries disembark their passengers.[176] A project feasibility study is being made into the possible construction of a rail-cum-road bridge across the Irrawaddy River so that Hinthada can be linked directly to Yangon by rail.[177]

In earlier days, there was an even closer linkage between the railways and the inland waterways. A 1941 edition of *The Handbook of Sailings and General Information* published by the Irrawaddy Flotilla Company states that:[178]

> *Irrawaddy Flotilla Company's Ferry Steamers upward bound wait the arrival of the Rangoon-Prome train at Prome (due 5-33 a.m. unless duly delayed,). Downward bound steamers arrive in Prome to connect with the 21-20 train from Prome to Rangoon daily.*

In the north at Katha:[179]

> *Irrawaddy Flotilla Company's steamers run daily between Katha and Bhamo, in connection with the Railway Company's trains. These steamers however will not wait more than two hours when the train is running late.*

In the south at Moulmein:[180]

> *Irrawaddy Flotilla Company's steamers maintain the connection across the Salween River between Martaban Railway terminus and Moulmein town and Moulmein South (on the Moulmein-Ye Railway).*

This service at Moulmein was in place until 2008 when the 2.4 *km* long Thanlwin Bridge was built over the Salween River.

The linkages between the railways and the Inland Water Transport fleet are not as strong today, but some are still there. For example, a branch line from the main Mandalay-Myitkyina line goes the short distance from Naba to Katha on the

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[176] The new Hinthada-Yangon railway line which opened in May 2014 was supposed to provide a direct link to Yangon, with the trip taking six hours. But this line is now closed as the track is bad. See Footnote 26 in this chapter and:

Aye Min Soe, (2014, May 25), *op. cit.*

[177] Thein Ko Lwin, (2016, August 23), "By-Elections to be Held Early Next Year", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs22/GNLM2016-08-23-red.pdf.

[178] *Irrawaddy Flotilla Co., Ltd.*, (1941), "Handbook of Sailings and General Information", Irrawaddy Flotilla Company, Rangoon, p.33. *[A copy of this booklet is my possession].*

[179] *Ibid*.

[180] *Ibid*.

Irrawaddy River, enabling river travellers to easily link to the rail network, and *vice versa*.[181] Minivans and pick-ups meet the train from Mandalay or Myitkyina at Naba to transport passengers to Katha.[182] This particular linkage between the railways and Inland Water Transport will be strengthened when construction of a railway line between Katha and Bhamo is completed.[183] Katha is on the west bank of the Irrawaddy River and Bhamo is further north on the east bank. A line from Katha to Moetagyi was opened in February 2010, and a line from Moetagyi to Kyautkyi was opened in February 2014.[184] Work started on the line in May 2007 and it is being built in three sections: Katha to Kyautkyi (37.1 miles); Kyautkyi to Sin Khan (28.3 miles); and Sin Khan to Bhamo (29.5 miles).[185] A road/rail bridge

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[181] Photographs of the train trip from Naba to Katha and back can be seen on the following website maintained by Jan Ford. Sections of the track are in quite poor condition. See:

Ford, Jan, "Railways in Burma – Flickr" website. Retrieved from: https://www.flickr.com/photos/janfordsworld/collections/72157631626170134/.

The line to Katha dates back to 1895. The Mu Valley State Railway built a line from Sagaing to Katha via Shwebo and Wuntho, reaching Katha in 1895, before extending the line to Myitkyina in 1898. It was the third major line in the country. See:

Weir, James, (2014, June 23), "Former Burma Railway Company Building, Yangon", *Heritage in the View* website. Retrieved from: https://jamesweir-hbc.com/2014/06/23/former-burma-railway-company-building-yangon/; and

Wikipedia website, "Myanmar Railways". Retrieved from: https://en.wikipedia.org/wiki/Myanmar_Railways.

At Naba Railway Station there is a weigh bridge (no longer in use) dated 1893. It was supplied by W. & T. Avery Ltd., a British manufacturer of weighing machines based in Birmingham.

[182] *The Man in Seat 61* website, *op. cit*.

[183] *Ministry of Rail Transportation*, (2015, November 23), *op. cit*.; and

Ford, Jan, (2015, June 29), "New Railway from Katha to Bhamo", *Jan Ford's World* website. Retrieved from: https://janfordsworld.blogspot.com.au/2015/06/new-railway-from-katha-to-bhamo.html; and

Myo Min Tun, (2017, August 21), "Compensations for properties in Katha-Bhamo railway project to be offered", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-08-21.pdf; and

Myint Maung Soe, (2009, August 7), "Bhamo-Katha Railroad Project, a fruitful result of stability and peace", The New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs07/NLM2009-08-07.pdf; and

The New Light of Myanmar, (2010, February 22), "MR to link Mandalay and Bhamo". Retrieved from: http://www.burmalibrary.org/docs08/NLM2010-02-22.pdf.

[184] *The New Light of Myanmar*, (2010, February 22), *op. cit.;* and

mitv News, (2014, February 8), "Motargyi-Chaungwa-Kyaukkyi railroad section railroad project put into service". A video recording on Youtube. Retrieved from: https://www.youtube.com/watch?v=pNg4p4q1KEI.

Moetagyi can also be spelt as "Moe Tar Gyi" which is the name on the railway station.

[185] Ford, Jan, (2015, June 29), "New Railway from Katha to Bhamo", *op. cit.*

has been built over the Irrawaddy River at Sin Khan.[186] Details of the line are summarised in Table 33 below.[187]

Section	Length (Miles)	Starting Date	Opening Date
Opened Section			
Katha - Moetagyi	16.7	16 May 2007	20 February 2010
Moetagyi - Kyautkyi	20.4	16 May 2007	7 February 2014
	37.1		
Under construction			
Kyautkyi - Sin Khan - Bhamo	57.8	16 May 2007	
	94.9		

Table 33: The railway line under construction from Katha to Bhamo.

Bhamo is quite close to the Chinese border and has a history as an important town on an old trade route between Burma and China.[188] There was even talk in the late 1800's of a British-built railway from Bhamo to Yunnan Province in China, the so-called "golden railway", but the plans were eventually shelved.[189] When the current line from Katha to Bhamo is eventually completed, it may form a valuable part of a route for transporting goods between Burma and China via Bhamo, both exports to China from Burma (such as agricultural produce) and imports to Burma from China (for example, manufactured goods).[190]

3.8 The Transport of Rice in Burma

Rice is the main crop of Burma's agricultural sector, in 2012 accounting for 36 per cent of the economy and employing a large portion of the country's population.[191]

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[186] *The New Light of Myanmar,* (2010, February 24), "Government working for smooth transportation in Katha-Bhamo region". Retrieved from: http://www.burmalibrary.org/docs08/NLM2010-02-24.pdf; and

Tun Zaw, (2010, November 12), "A visit to Katha-Ayeyawady Bridge (Sinkhan) railroad section", The New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs09/NLM2010-11-12.pdf.

[187] *Ministry of Rail Transportation*, (2015, November 23), *op. cit*.

[188] Smith, Adrian J. (1999), "Privatized Infrastructure: The Role of Government", ICE Publishing, London, pp.48-51.

[189] *Ibid.*

[190] It may be some time before this line is complete, as it took 10 years to build the 37 miles of line from Katha to Kyaukkyi.

[191] Chanjaroen, Chanyaporn, (2012, October 29), "Myanmar Seeks to Restore Status Among Top Rice Exporters", Bloomberg. Retrieved from: http://www.bloomberg.com/news/2012-10-28/myanmar-seeks-to-regain-top-spot-in-rice-exports-southeast-asia.html.

About 60 per cent of the population of Burma is dependent on the rice economy.[192] Burma was once the world's top exporter of rice shipping 3.428 million tons of rice in 1934, but exports fell after Independence in 1948 and particularly under the military governments since 1962.[193] The significant fall in rice exports since World War II can be seen in Figure 43.[194] The data are shown in tonnes, as this is how the Statistical Yearbook reports it now.

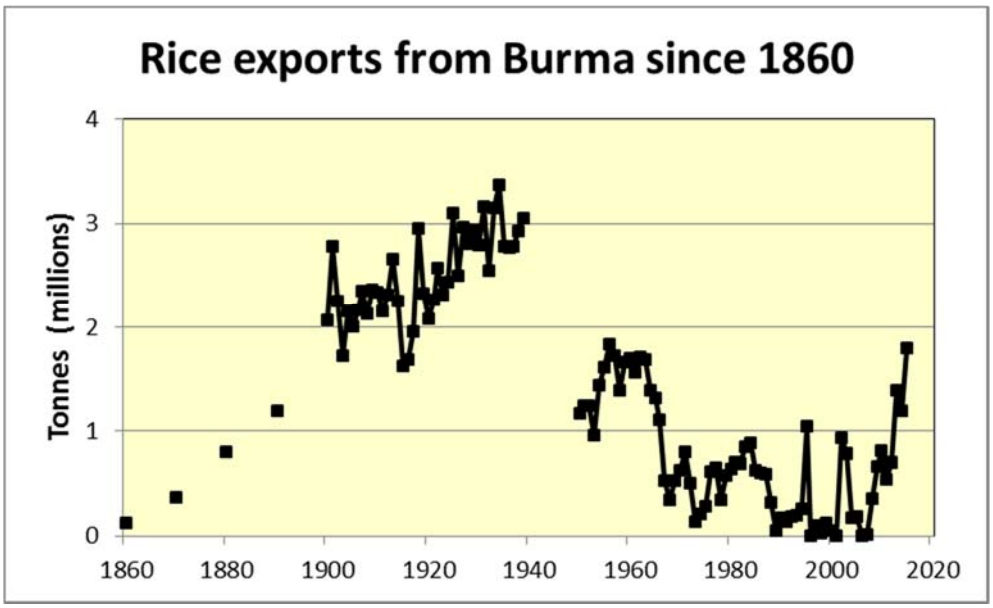

Figure 43: Rice exports from Burma since 1860.

Rice exports for the year ended 31st March 2016 were 1.562 million tonnes.[195] Myanmar Rice Federation reported a figure of 1.7 million tonnes for the year ended 31st March 2017, and is forecasting exports of 2 million tonnes for the current fiscal

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[192] *Bangkok Post*, (2013, April 9), "Japan prepares for major role in Myanmar's rice industry". Retrieved from: http://www.bangko2kpost.com/business/news/344607/japan-prepares-for-major-role-in-myanmar-s-rice-industry.

[193] McLannahan, Ben and Jake Maxwell Watts, (2013, March 26), "Myanmar to resume rice exports to Japan", Financial Times. Retrieved from: http://www.ft.com/intl/cms/s/0/a75d5950-92e9-11e2-b3be-00144feabdc0.html#axzz2QFiKi2g8; and

Saito and Kiong, (1999), *op. cit.*, p.80.

[194] The data from 1860 to 1992 are taken from Saito & Kiong (*op. cit.*), who have published data compiled by Furnivall. The figures given by Saito & Kiong are in tons. These figures have been converted to tonnes which is how current editions of the Statistical Yearbook report rice exports.

[195] This figure is from the November 2016 edition of the *Selected Monthly Economic Indicators,* published by the Central Statistical Organization (CSO). The figures published by the CSO include broken rice. The Myanmar Rice Federation has reported a lower figure of 1.4 million tonnes for 2016, which may not include broken rice. See:

Central Statistical Organization website, *op. cit*.

year (the year ended 31st March 2018).[196] These figures are summarised in Table 34.[197]

Year ended 31st March	Rice exports (000's tonnes)	Change (% p.a.)
2011	536	
2012	707	32%
2013	1,397	98%
2014	1,192	-15%
2015	1,823	53%
2016	1,562	-14%
2017	1,700	9%
2018 (Estimate)	2,000	18%

Table 34: Rice exports from Burma.

There has been increasing demand from Asia, Africa and Europe, with 60% of Burma's rice exports going to China.[198] Exports for the year ended 31st March 2016 were affected by severe floods in July and August 2015.[199] Burma is hoping to become one of the top three rice exporters in the world in the next few years, with the government predicting exports of 4 million tonnes by 2020.[200]

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[196] *The Global New Light of Myanmar,* (2017, May 5), "Myanmar targets 2M tonnes of rice exports this FY". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-05-05-red.pdf.

[197] The data in this table for 2011-16 are taken from the *Selected Monthly Economic Indicators* and the Statitsical Yearbooks published by the Ministry of Planning and Finance, whereas the data for 2017-2018 are from the Myanmar Rice Federation. See:

Central Statistical Organization website, *op. cit*.; and

Myanmar Statistical Information Service website. Retrieved from: http://www.mmsis.gov.mm/sub_menu/statistics/fileDb.jsp; and

The Global New Light of Myanmar, (2017, May 5), *op. cit*.

[198] Ye Myint, (2015, April 24), "Myanmar rice exports set to top 2 tons as China lifts import restriction", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-04-24.pdf; and

Aye Min Soe, (2015, May 20), "Myanmar eyes 2 million tons of rice exports in 2015-16 FY", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-05-20.pdf; and

The Global New Light of Myanmar, (2017, May 5), *op. cit*.; and

May Thet Hnin, (2017, August 16), "Crop insurance, land reform and investment are essential to Myanmar's agricultural sector", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-08-16.pdf.

The article by May Thet Hnin is an interview with Dr Soe Tun, Chairman of the Myanmar Rice Federation. Countries in Asia purchasing rice from Burma include Malaysia, Singapore, Japan and Bangldesh, as well as China.

[199] Kyaw Hsu Mon, (2015, August 31), "Rice Federation Forecasts Exports to Resume as Scheduled in Mid-September", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/business/rice-federation-forecasts-exports-to-resume-as-scheduled-in-mid-september.html.

[200] *The Global New Light of Myanmar*, (2015, February 16), "Myanmar has the potential to become a major rice producer". Retrieved from: http://www.burmalibrary.org/docs20/GNLM2015-02-16-red.pdf; and

The graph in Figure 44 shows how in 1960/61 Burma was exporting a similar amount of rice to Thailand, but by 2011/12 Burma was lagging significantly behind nearby countries such as Thailand, India and Vietnam.[201]

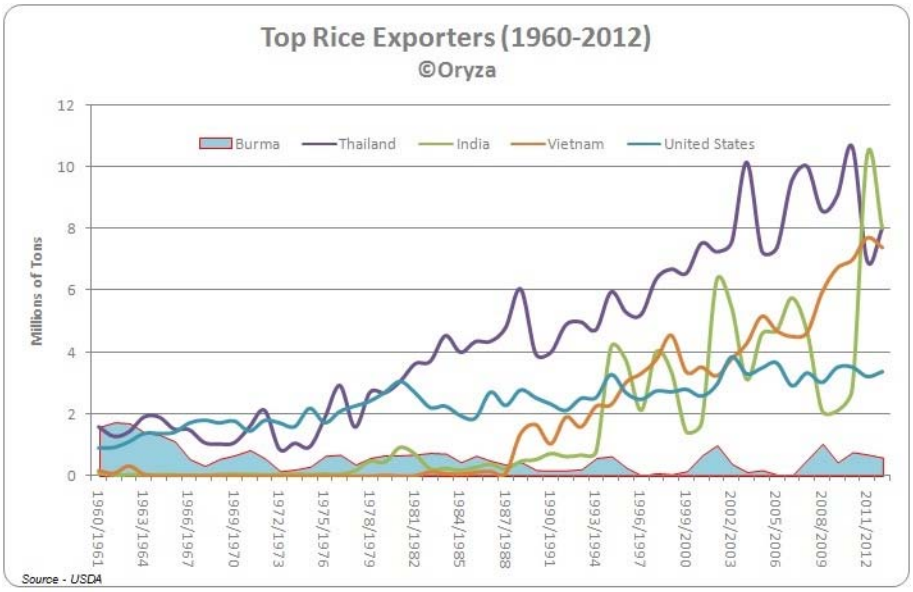

Figure 44: Top rice exporters (1960-2012).

There is growing interest in the rice sector in Burma as the country moves towards democracy. For the first time in 45 years, rice was exported to Japan in May 2013.[202] Joint ventures are being formed between the Myanmar Agribusiness Public Corporation and major Japanese companies such as Mitsui & Co. and Mitsubishi Corporation, with plans to build a network of rice mills and processing plants in Burma.[203] A further 6,000 tonnes of high quality rice was exported to Japan in 2014, and Burma was also test-marketing high quality rice to European countries.[204] With approximately 60% of Burma's rice exports going to China, the

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Aye Min Soe, (2015, May 20), *op. cit.*

[201] *Oryza*, (2013, May 7), "Burma Eyes Top Rice Status Again". Retrieved from: http://oryza.com/content/burma-eyes-top-rice-exporter-status-again.

[202] *The New Light of Myanmar*, (2013, March 19), "Myanmar to ship first batch of rice export to Japan in early May". Retrieved from: http://www.burmalibrary.org/docs15/NLM-2013-03-19.pdf; and

Bangkok Post, (2013, April 9), *op. cit*.; and

McLannahan and Watts, (2013, March 26), *op. cit.*

[203] *Bangkok Post*, (2013, April 9), *op. cit.*

[204] *The Nation*, (2014, February 7), "High-quality rice to be exported to Japan for second time". Retrieved from: http://www.nationmultimedia.com/aec/High-quality-rice-to-be-exported-to-Japan-for-seco-30226263.html; and

Boot, William, (2014, February 8), "Burma's Rice Industry Probing New Markets in European Union", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/business/irrawaddy-business-roundup-february-8-2014.html.

China-Burma Railway, if it is ever built, could play an important role in the export of rice to China.

Burma has the potential to rival top rice exporters such as Thailand, Vietnam and India if crop yields, farm development and infrastructure can be improved. President U Thein Sein, who is a rice farmer himself, was keen for Burma to improve yields and the varieties of rice grown, and endeavoured to increase collaboration with the International Rice Research Institute based in the Philippines.[205] The Secretary General of the Myanmar Rice Federation, U Ye Min Aung, hopes that Burma can export about three million tons of rice by 2020, but this will depend very much on an improvement in government funding and policy, including construction of infrastructure such as all-season ports, high-capacity warehouses and rice reprocessing plants.[206] A report from the World Bank in February 2014 highlighted the urgent need to modernise Burma's rice-milling industry. It described the processing units as obsolete, indicating that there was a 15-20% quality and quantity loss during processing.[207] The report's view was that investment in rice milling is the key to boosting exports.[208] The railways should be able to play a role in boosting exports, by providing more efficient and cheaper transport from the growing regions to the port of Yangon. There is great potential for Myanma Railways to aid in the recovery of Burma as a major rice exporter.

The Irrawaddy Delta is the main area in Burma for rice production. At present about three quarters of the rice from the Irrawaddy Delta is shipped to Yangon via barges.[209] In a report published in 2012 by Reuters, U Ye Min Aung, commented:[210]

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[205] Barona-Edra, Lizbeth, (2014), "Myanmar rises", Rice Today, January – March 2014, published by the International Rice Research Institute. Retrieved from: http://irri.org/rice-today/myanmar-rises.

[206] Zaw Htike, (2014, March 17), "Rice exports to double in 5 years", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/business/9872-rice-exports-to-double-in-5-years.html.

[207] *World Bank*, (2014), "Myanmar: Capitalizing on Rice Export Opportunities", Washington DC, World Bank Group, p.xv. Retrieved from: http://documents.worldbank.org/curated/en/2014/02/19226579/myanmar-capitalizing-rice-export-opportunities.

[208] Kyaw Hsu Mon, (2014, June 13), "Investment in Rice Milling Key to Boosting Export, Report Says", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/business/investment-rice-milling-key-boosting-export-report-says.html.

[209] *World Bank*, (2014), *op. cit.*, p.28.

[210] Szep, Jason, (2012, August 9), "Down on the farm", Reuters. Retrieved from: http://graphics.thomsonreuters.com/12/08/Myanmar_farm.pdf; and

Trucking rice from Pathein, a major rice village in the Irrawaddy delta, to the commercial capital Yangon, just 193 kilometres (120 miles) away, is costlier than shipping it from Yangon to Singapore, 2,500 kilometres (1,550 miles) to the south.

There are plans to construct a new railway from Pathein to Yangon via Nyaungdon to address this issue.[211] This line, which is 89 miles in length, has been under construction since the 2009/2010 fiscal year and is about 50% complete.[212] The Pathein-Einme section of the line was completed in 2011 and is 20.75 miles long.[213] It took 15 months to complete this section of the line. I travelled on the line from Pathein to Einme in January 2014 in a diesel railcar. For a new line, its condition is poor, and I doubt it will be of much value in solving the transport problems from the Irrawaddy Delta. It is badly overgrown with weeds for much of its length, as can be seen in Plate 35.[214]

Plate 35: The new line from Pathein to Einme, badly overgrown with weeds.

Boot, William, (2012, August 14), "Can Burma Become World Rice Bowl Again?", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/business/can-burma-become-world-rice-bowl-again.html.

[211] Moe Myint Lin Let, (2010, October 30), *op. cit*.

[212] Completion was expected by 2014, but this was never achieved.

[213] *The New Light of Myanmar*, (2011, March 21), "Pathein (Begarat)-Einme railroad section commissioned into service". Retrieved from: http://www.burmalibrary.org/docs11/NLM2011-03-21.pdf; and

Sein Lwin Aung, (2013, January 31), "Yangon-Pathein railway link nearing completion", The New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs14/NLM2013-01-31.pdf.

[214] This photograph was taken near Sin Gaung on 1st January 2014, about one and a half hours from Einme. The diesel railcar was only travelling at 14 kilometres per hour. The 21 mile trip from Pathein to Einme took three hours.

A major new road/rail bridge has been built at Nyaungdon to cross the Irrawaddy River, making it much easier to move between Yangon and the Irrawaddy Delta region.[215] When President U Thein Sein opened the bridge in November 2011, he stressed how a line was being constructed from Kalaymyo in the north of Burma to Hinthada in the south (the Kalaymyo-Kyangin-Pakokku-Hinthada line).[216] This line, if properly built, would facilitate easier shipment of rice from the delta to northern Burma. At present, the Kalaymyo-Pakokku line is not operational for its entire length, and only about half of the line from Kyangin to Pakokku can be used. It joins up with the existing Kyangin-Hinthada line.[217]

The amount of rice transported by the railways fell during the period 1963 to 2015, as can be seen in Figure 45.

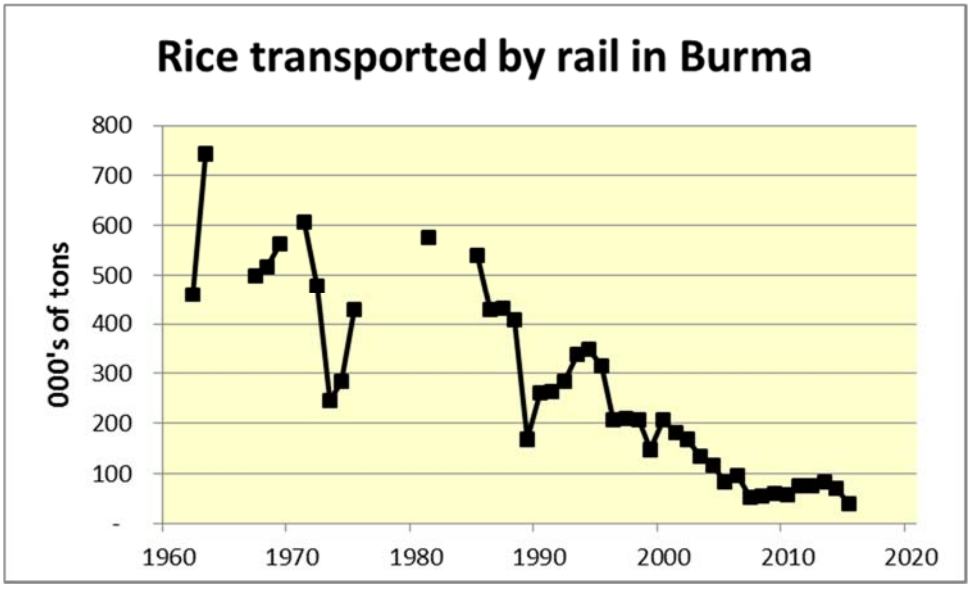

Figure 45: The amount of rice transported by rail in Burma.

The amount of rice transported by rail has fallen from 743,200 tons in 1963 to just 38,000 tons by 2015, a fall of 95%, or 5.6% p.a. This decline is astonishing

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[215] *The New Light of Myanmar*, (2011, April 26), "President highlights timely completion as well as quality in building bridges". Retrieved from: http://www.burmalibrary.org/docs11/NLM2011-04-26.pdf; and

The New Light of Myanmar, (2011, April 26), "President U Sein visits construction site of Ayeyawady Bridge (Nyaungdon)". Retrieved from: http://www.burmalibrary.org/docs11/NLM2011-04-26.pdf.

[216] *The New Light of Myanmar*, (2011, November 28), "May Ayeyawady dwellers serve interests of region and nation with heart of gold like mighty white elephant appeared in the region. President U Thein Sein attends inauguration of Ayeyawady Bridge (Nyaungdon)". Retrieved from: http://www.burmalibrary.org/docs12/NLM2011-11-28.pdf.

[217] The line between Seikphyu and Minbu is apparently complete, but is not in use. Further south, the line between Phayabaw and Kyangin was blocked by a landslide in 2013 and had not been repaired. In the north, a line runs from Kalaymyo to Gangaw, but the weekly train that went further to Ye Myet Ni has been cancelled. But beyond that the line is blocked where the Ponnya Taung Railway Tunnel has collapsed. Beyond the tunnel, the line is operating between Kyawtha and Pakokku.

when one considers the strong growth in paddy production over the same time.[218]. For the period 1963-2015, paddy production grew from 7.55 million tons to 26.4 million tons, which is a growth rate of 2.4% p.a. These figures are shown in Table 35.

Year ended 31st March	1963	2015	% Change	% Change p.a.
Production of paddy (000' s tons)	7,550	26,423	250%	2.4%
Rice transported by rail (000's tons)	743	38	-95%	-5.6%

Table 35: Paddy production compared to the amount of rice transported, from 1963 to 2015.

In terms of ton-miles, the story is no better, as can be seen in Figure 46, with the ton-miles figure falling from 89 million ton-miles in 1963 to just 13 million ton-miles by 2015, a fall of 85% or 3.6% p.a.

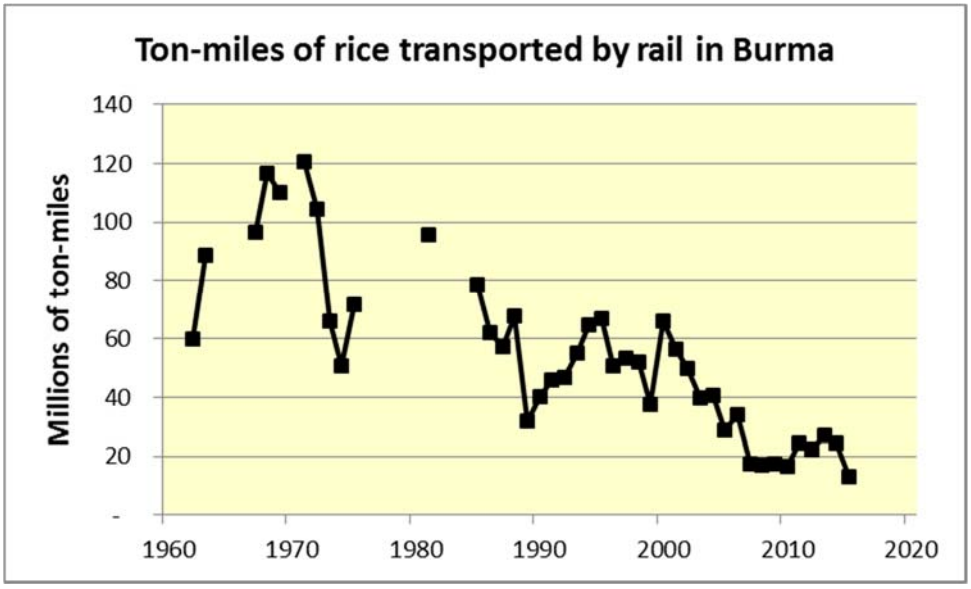

Figure 46: Ton-miles of rice transported by rail in Burma.

The drop in ton-miles is less than the drop in tons as the average distance rice is being transported has increased by 194% or 2.1% p.a., from 119 miles in 1963 to 350 miles in 2015, as shown in Figure 47.

[218] Paddy production is discussed later in this chapter, and is shown in Figure 51.

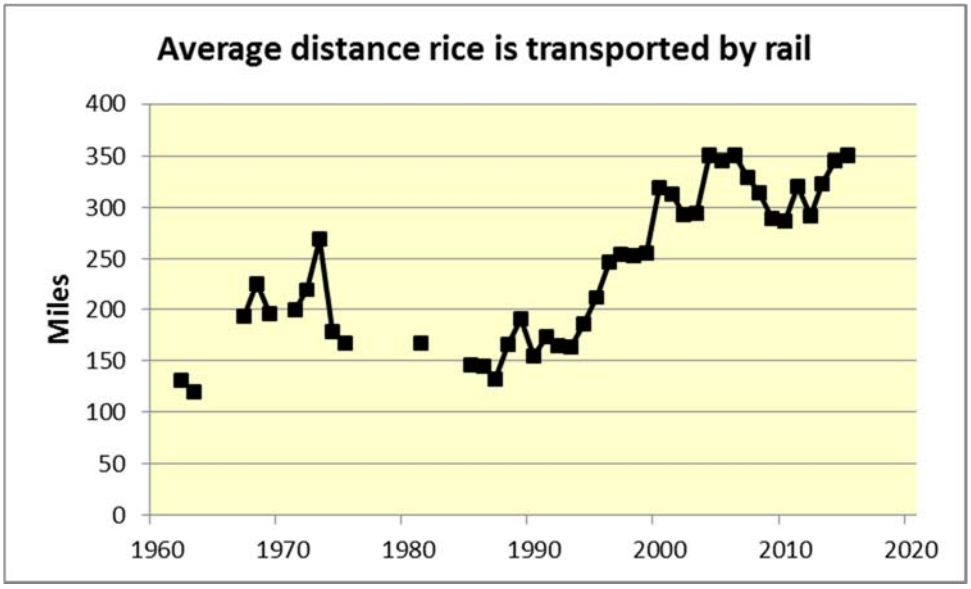

Figure 47: The average distance rice is transported by rail in Burma.

The inland waterways suffered a similar fate, with the amount of rice transported by government vessels on the inland waterways falling to just 1,000 tons in 2009, to zero by 2011 and 2012, but recovering to 44,000 tons in 2015. This compares to 416,000 tons in 1983.[219] A comparison of the amount of rice transported by the railways *vs.* the inland waterways is shown In Figure 48.

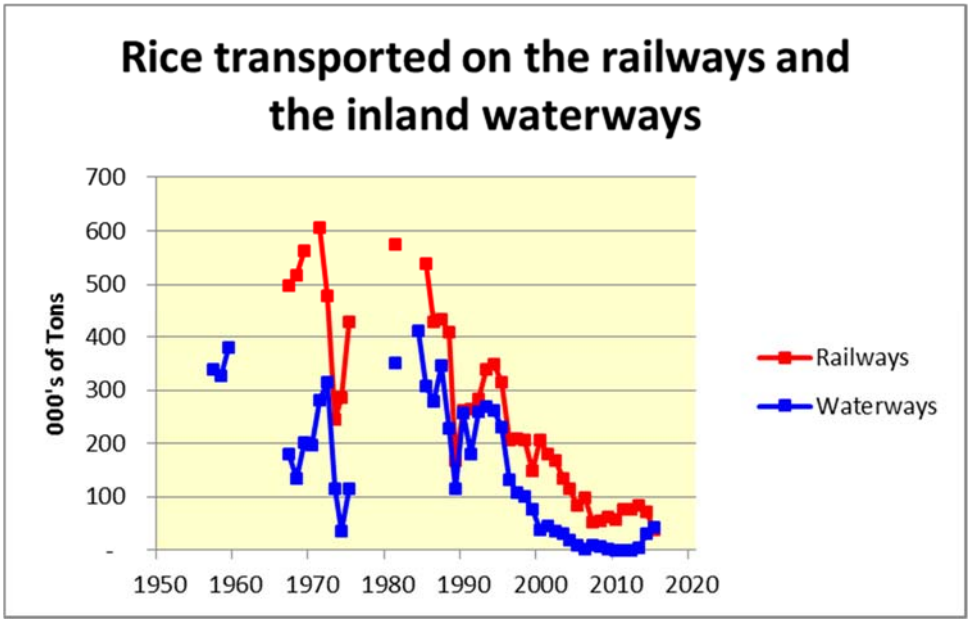

Figure 48: The amount of rice transported by rail and the inland waterways.

[219] In late December 2013 I visited the Inland Water Transport office in Pathein. The manager informed me that the last passenger service to Yangon had been on 16th September 2013 as there were usually only three or four passengers, and also that there was no cargo to transport. What cargo was being transported by the private sector is unknown.

The amount of rice transported by private vessels is unknown. The results for ton-miles of rice transported on the inland waterways follow a similar pattern to that for the railways, as can be seen in Figure 49.

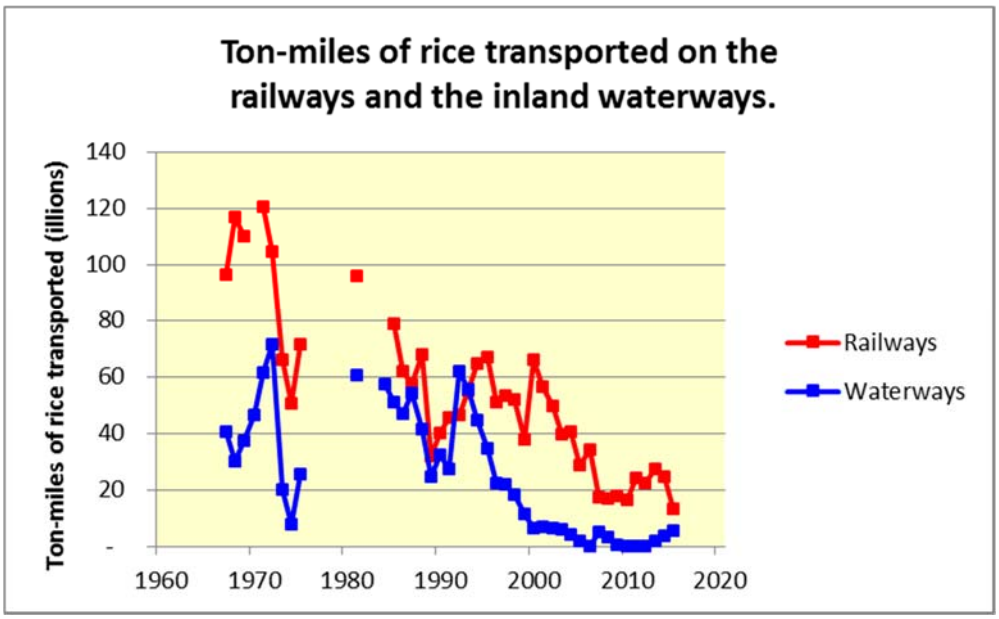

Figure 49: Ton-miles of rice transported by the railways and inland waterways.

Even the transport of paddy by the railways has dwindled away to nothing, as can be seen in Figure 50.

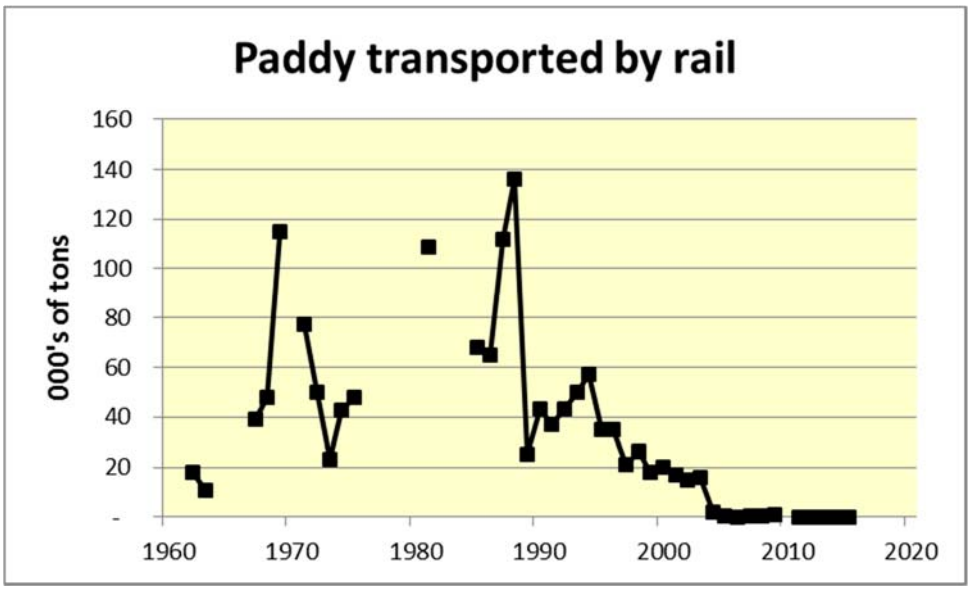

Figure 50: The amount of paddy transported by rail.

Even though the amount and value of paddy transported is much smaller than rice, the same trend is apparent.[220]

[220] In 1981 the amount of paddy transported by rail was 109,000 tons, compared to 575,000 tons of rice. By 2015, no paddy was transported by rail, and just 36,000 tons of rice.

The transport available for rice has been described as "*inadequate and sluggish*".[221] For example, it is still very labour intensive as can be seen in Plate 36 where rice is being unloaded at Pakokku on the Irrawaddy River using manual labour.

Plate 36: Rice being unloaded at Pakokku.

The level of paddy production is a good indicator of how the rice sector is faring. Figure 51 shows paddy production since 1830, with a noticeable sharp drop during World War II, and again since 2011.

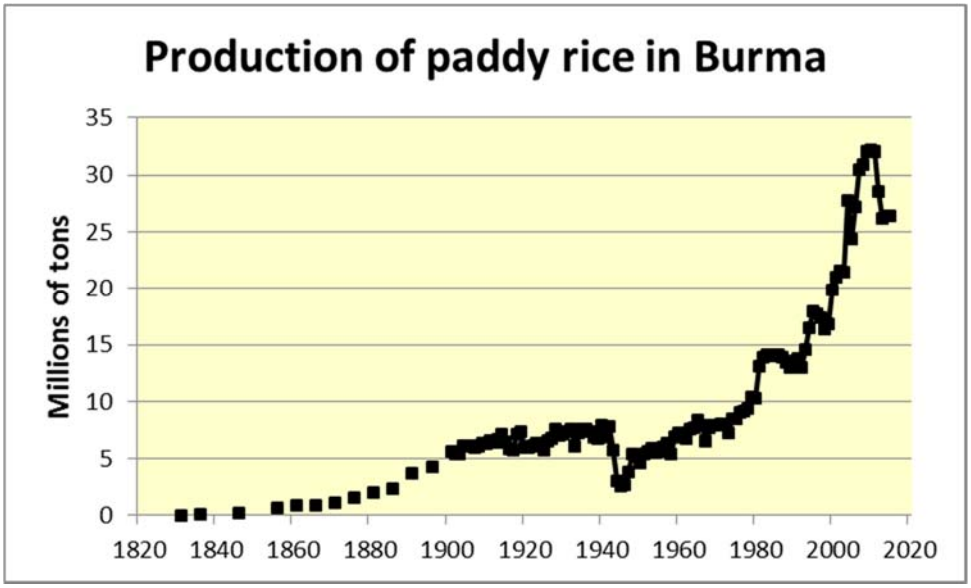

Figure 51: Paddy production in Burma.

[221] Boot, (2012, August 14), *op. cit.*

Burma produced about 10.7 million tons of milled rice in 2011/12, based on paddy production of 17.4 million tons, according to the United States Department of Agriculture (USDA).[222] The USDA's historical figures and forecasts were significantly below those of the UN Food and Agricultural Organization (FAO), as can be seen in Figure 52.[223]

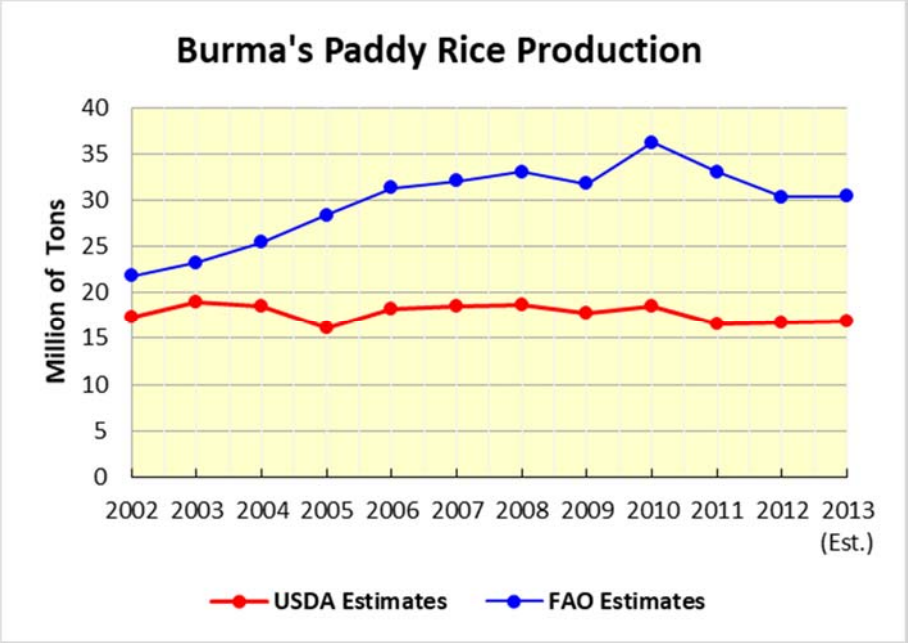

Figure 52: Burma's paddy rice production.

The USDA believed that the Myanmar government overstated rice production by a wide margin, and pointed out that the rice production figures provided by the government did not match with consumption levels in the country.[224]

In contrast to the declining amount of rice being transported by rail and the inland waterways, over the last five decades the amount of paddy rice harvested has risen strongly from 7.2 million tons in 1960 to 32.1 million tons by 2011, before falling back to 26.4 million tons by 2015. This is a rise of 2.5% p.a. over the 55 years from 1960 to 2015. For a similar period (1967-2015), the amount of rice transported by rail fell by 95% or 5.6% p.a. Note that the data in Figure 51 above

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[222] Phoonphongphiphat, Apornrath, (2013, March 23), "Idle Thai Rice Exporters May Shift Expertise to Burma", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/archives/30279; and

Oryza, (2013, February 14), *op. cit.*

[223] The informatiion for the graph is sourced from:

Oryza, (2013, February 14), *op. cit.*

The *Statistical Yearbook 2011*, published by the Government of Myanmar, gives a figure of 32 million tons for the year ended 31st March 2011, which is significantly higher than the USDA figures.

[224] *Oryza*, (2013, February 14), *op. cit.*

are consistent with data used by the FAO (see Figure 52 above), but disagree with the US Department of Agriculture's figures. A table summarising the figures for 1971 and 2015 is shown below.

		1971	2015	Change (%)	Change (% p.a)
Railways					
Rice transported	(000's of Tons)	605	38	-94%	-6.7%
Ton-miles of rice transported	(000's of Ton-miles)	120,544	13,313	-89%	-5.4%
Inland Waterways					
Rice transported	(000's of Tons)	280	44	-84%	-4.5%
Ton-miles of rice transported	(000's of Ton-miles)	61,644	5,383	-91%	-5.9%
Production of paddy rice					
Amount produced	(000's of Tons)	8,033	26,423	229%	3.0%

Table 36: Rice transported compared to paddy rice harvested for 1971 and 2015.

The need for improved facilities for transporting rice by rail was identified by the World Bank in 1980. In a lengthy report entitled "*Burma - Grain Storage Project*" the World Bank noted that:[225]

> *The major rice movement is from rice surplus areas of Lower Burma to rice deficit areas of Upper Burma for local consumption and to major ports, such as Rangoon and Bassein for export. Official movement of rice is about 1.6 M tons, of which 1.0 M tons is for internal consumption. About 54% of the rice is moved by water and 46% by land.*

Commenting on the transport situation, the World Bank observed that:[226]

> *AFPTC often uses trucks even for long haul, from Rangoon to Mandalay and Thazi, though rail transport is cheaper. This is due to a lack of fast and fully scheduled rice transport by railways.*

To address this deficiency the World Bank made plans to improve rice transportation and to reduce costs by rehabilitating sixty rice wagons and operating four unit trains (i.e. goods trains solely for the transport of rice). The Grain Storage Project, including the improvement of transportation, was completed by 1988,

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[225] *World Bank*, (1980), "Burma - Grain Storage Project", Washington DC, World Bank. Retrieved from: http://documents.worldbank.org/curated/en/1980/11/726628/burma-grain-storage-project.

[226] *Ibid*.

AFPTC stands for "Agricultural and Farm Produce Trade Corporation". It was renamed the Myanmar Agricultural Products Agency in 1989.

lifting transport of rice to 134,000 tons compared to 100,000 tons before the project.[227]

By 2015 just 38,000 tons of rice were being transported by rail. There is clearly much room for improvement by Myanma Railways, first to get back to where the level of rice transportation was in the early 1970's, and then to cater for the increasing production of rice in Burma.

3.9 The Downturn on the Railways and Inland Waterways over Recent Years

It is important to comment on the changes happening in the last few years, as there has been a significant downturn in passenger numbers on the railways, and a bigger downturn on the inland waterways. This can be seen in Figure 37 where passenger numbers on the railways is compared to passenger numbers on the inland waterways. Changes from 2008 in passenger numbers as well as freight are shown in Tables 37 and 38. The year 2008 is chosen as a point of comparison as this is when passenger numbers on the railways peaked.

[227] *World Bank*, (1988), "Burma - Grain Storage Project. Project Completion Report", Washington DC, World Bank. Retrieved from: http://documents.worldbank.org/curated/en/1988/04/742136/burma-grain-storage-project.

	Railways - Passenger Numbers			Railways - Passenger-Miles		
Year	Passenger Numbers (Million)	% Change p.a.	Total % change since 2008	Passenger-Miles (000's)	% Change p.a.	Total % change since 2008
2008	76.0			3,378		
2009	73.6	-3%	-3%	3,349	-1%	-1%
2010	71.6	-3%	-6%	3,338	-0.3%	-1%
2011	67.7	-6%	-11%	3,329	-0.3%	-1%
2012	64.2	-5%	-15%	3,093	-7%	-8%
2013	53.8	-16%	-29%	2,366	-24%	-30%
2014	53.2	-1%	-30%	2,227	-6%	-34%
2015	47.9	-10%	-37%	2,123	-5%	-37%
	Railways - Freight			Railways - Freight Ton-Miles		
Year	Freight (000's tons)	% Change p.a.	Total % change since 2008	Freight ton-miles (000's)	% Change p.a.	Total % change since 2008
2008	2,930			535		
2009	2,950	1%	1%	573	7%	7%
2010	3,330	13%	14%	658	15%	23%
2011	3,408	2%	16%	698	6%	30%
2012	3,580	5%	22%	722	3%	35%
2013	2,839	-21%	-3%	602	-17%	12%
2014	2,467	-13%	-16%	515	-14%	-4%
2015	2,280	-8%	-22%	505	-2%	-6%

Table 37: Changes since 2008 for the railways in Burma.

From this table it is clear there has been a steady decline in passenger numbers and passenger-miles on the railways since 2008. The most likely cause of this is competition from buses on price, comfort and duration of travel. For freight the story is different, with a slow but steady increase from 2008 to 2012, followed by a sharp decline after 2012.

	Inland waterways - Passenger Numbers			Inland waterways - Passenger-Miles		
Year	Passenger Numbers (Million)	% Change p.a.	Total % change since 2008	Passenger-Miles (000's)	% Change p.a.	Total % change since 2008
2008	26.9			721		
2009	27.4	2%	2%	783	9%	9%
2010	27.1	-1%	1%	820	5%	14%
2011	27.6	2%	3%	902	10%	25%
2012	19.3	-30%	-28%	531	-41%	-26%
2013	15.0	-22%	-44%	210	-60%	-71%
2014	13.2	-12%	-51%	146	-30%	-80%
2015	12.3	-7%	-54%	97	-34%	-87%
	Inland waterways - Freight			Inland waterways - Freight ton-miles		
Year	Freight (000's tons)	% Change p.a.	Total % change since 2008	Freight ton-miles (000's)	% Change p.a.	Total % change since 2008
2008	4,478			582		
2009	4,658	4%	4%	639	10%	10%
2010	4,685	1%	5%	687	7%	18%
2011	4,786	2%	7%	754	10%	30%
2012	3,347	-30%	-25%	520	-31%	-11%
2013	2,117	-37%	-53%	332	-36%	-43%
2014	1,898	-10%	-58%	283	-15%	-51%
2015	1,787	-6%	-60%	282	0%	-51%

Table 38: Changes since 2008 for the inland waterways in Burma.

The trend for the inland waterways is a decline in all four areas in recent years. Passenger numbers and passenger-miles fell heavily in 2012 and 2013 and declined further in 2014 and 2015. Competition from buses and the ageing of the Inland Water Transport fleet are probably the cause of this decline. Mr U Shein Yaw, Deputy General Manager of Inland Water Transport, described the fleet as "*old and obsolete*" in a presentation in March 2014.[228] The decline in freight is equally as bad, due in part to competition from trucks, lack of containerisation, and poor inland port facilities for loading and unloading.[229] In September 2015, Inland Water Transport announced that it had reduced its operations by 60%, and that in the Irrawaddy Delta it was only using 20 vessels in its operations compared to 80 before.[230] Inland Water Transport is responding to the decline with plans to

[228] *Inland Water Transport*, (2014, March 7), *op. cit*.

[229] *Ibid.*

[230] Ko Moe, (2015, September 6), "60 percent dip for Inland Water Transport", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-09-06-red.pdf.

modernise its vessels and extend the shipping lines.[231] However, it has also cut services. In July 2016 U Aung Than Myaing from Inland Water Transport stated:[232]

> *Although there are plans to extend the shipping lines, some routes have been suspended due to a decrease in the number of passengers and the volume of commodities. So, we need safe, strong and modern ships.*

The sharp downturn in both passenger numbers and freight in 2012-2014 was most probably due to this suspension of various services by Inland Water Transport. This downturn can be seen in Table 38, Figure 36 (*Passenger numbers on the inland waterways*) and Figure 40 (*Passenger-miles on the inland waterways*) above. The government has been advised by the Asian Development Bank to either privatise or corporatise Inland Water Transport to try to cover the losses being incurred.[233]

The four graphs in Figures 53 to 56 below show monthly data for Passenger-Miles and Freight Ton-Miles for the railways and inland waterways.[234] For the year ended 31st March 2017, the year-to-date figures for the railways (April to October 2016) for Passenger-Miles rose by 0.8% and Freight Ton-Miles declined by 7.2%, compared to the same period in the previous year.

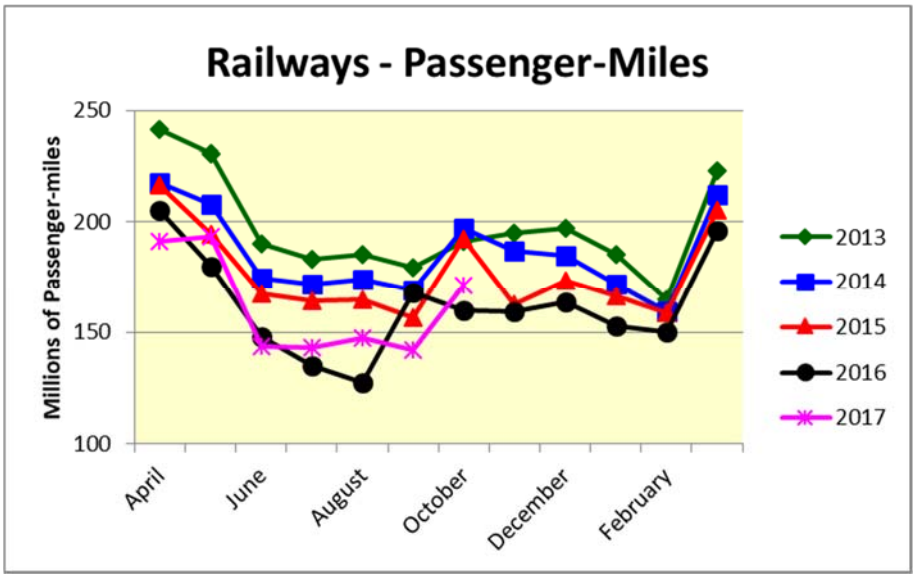

Figure 53: Monthly data for Passenger-Miles on the railways.

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[231] *The Global New Light of Myanmar*, (2016, July 1), "IWT to extend ship lines". Retrieved from: http://www.burmalibrary.org/docs22/GNLM2016-07-01-red.pdf.

[232] *Ibid.*

[233] Aung Thant Khaing, (2016, April 10), "IWT advised to sell. IWT considers corporatisation or privatisation to recover losses", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs22/10_April_16_gnlm.pdf.

[234] The years referred to in the four graphs are for the years ended 31st March.

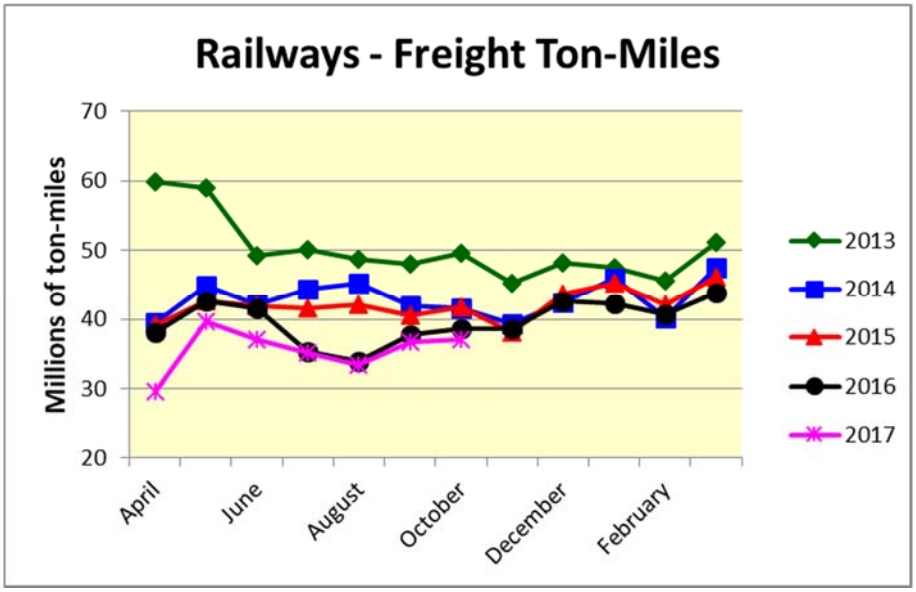

Figure 54: Monthly data for Freight Ton-Miles on the railways.

The story is worse for the inland waterways. The Freight Ton-Miles figures are volatile. For the year-to-date (April to October 2016) for the year ended 31st March 2017 the figures are considerably worse for both Passengers-Miles and Freight Ton-Miles, down by 20% and 36% respectively compared to the same period in the previous year.[235] It is clear that the government-owned Inland Water Transport is suffering badly.

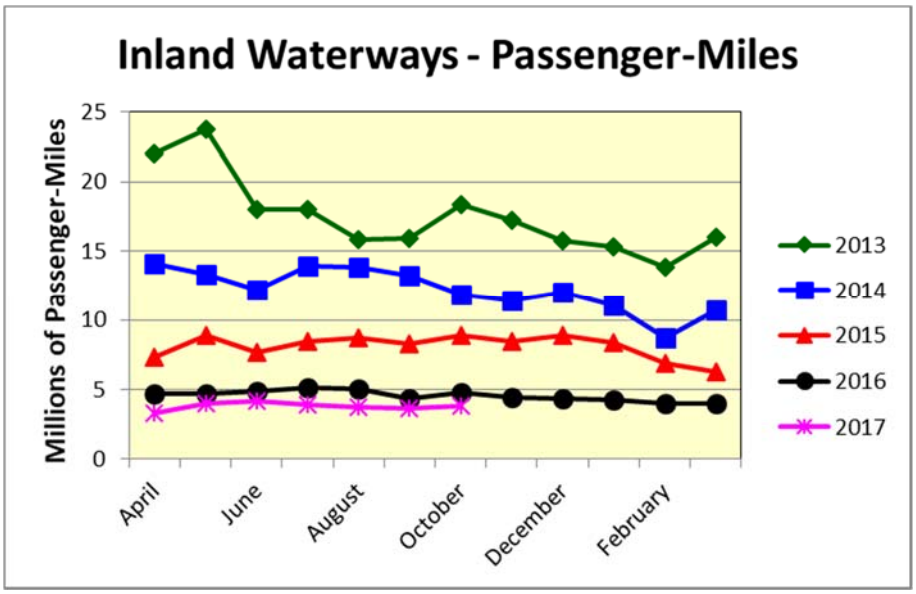

Figure 55: Monthly data for Passenger-Miles on the inland waterways.

[235] In Figure 56 the figure for August 2015 first reported by the Central Statistical Organization (CSO) was unusually high at 26.317 million freight ton-miles. The annual figure for the year ended 31st March 2016 has since been revised down to 186.163 million freight ton-miles. I have therefore adjusted the August 2015 figure to 13.467 million freight ton-miles in order to be consistent with the annual total.

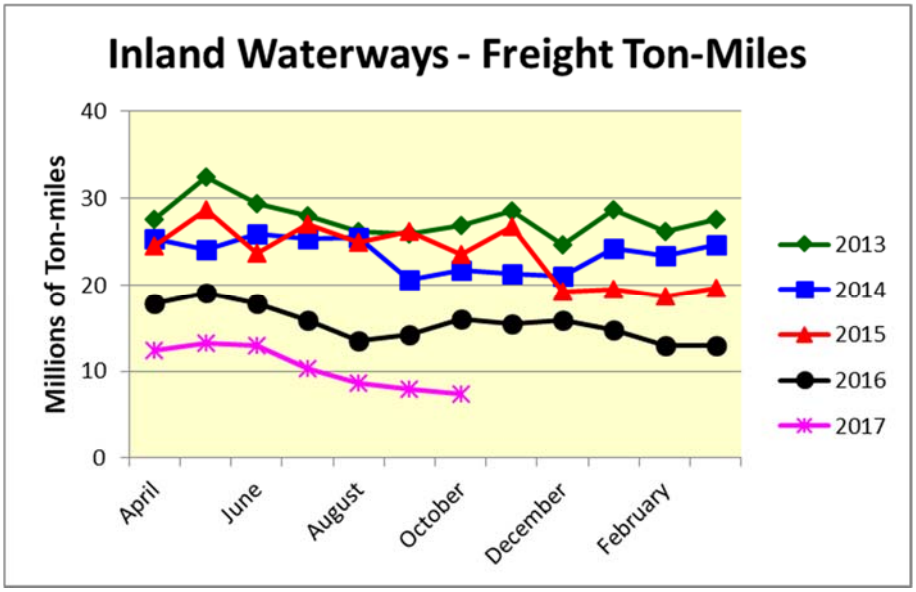

Figure 56: Monthly data for Freight Ton-Miles on the inland waterways.

Comparison of the year-to-date figures for the 2017 financial year (for the seven months from April to October 2016) is shown in Table 39 below:

Item	Change for Year-to-Date (April to October 2016)
Railways	
Passenger-miles	0.8%
Freight ton-miles	-7.2%
Inland Waterways	
Passenger-miles	-20%
Freight ton-miles	-36%

Table 39: Year-to-date changes for passenger-miles and freight ton-miles.

The only area showing any resilience is passenger-miles on the railways, which has risen by 0.8% for the year-to-date. This may be due to the improved passenger services on the Yangon-Mandalay line (e.g. the No. 5 Up and No. 6 Down services utilising the new Chinese train), and improved services on the Circular Railway in Yangon (e.g. where Japanese RBE's are quite common now).

Perhaps the key point to make from the above four graphs is that in a strengthening economy, one would expect that the data for each year to be higher than the previous year. This is not happening. Some of the factors causing the decline in passenger numbers on the inland waterways (slow; cramped conditions; unreliable service, especially when water levels are low causing vessels to become stuck on sandbars) are probably similar to why passenger numbers on the railways

have fallen. The railways are slow; often have cramped conditions in Ordinary Class; and at times the service is unreliable, for example on the branch lines when trains are delayed while waiting for a late-running train to pass in the opposite direction.

3.10 A Comparison of Burma to the ASEAN Region

The ASEAN-Japan Transport Partnership has published data on railways and other modes of transport in the region for the period 2004 to 2012.[236] The data are for the year ended 31st December, which differs to the financial year in Burma. Myanma Railways has provided data to the Partnership for the year ended 31st December, and one can accordingly make meaningful comparisons between Burma and the ASEAN region. The countries with railways in the ASEAN region are Cambodia, Indonesia, Laos, Malaysia, Burma, Philippines, Singapore, Thailand and Vietnam. The method of comparison is to index the figures to 100 for the year 2004, and then to examine the relative movement up until 2012.

The total number of passengers on the railways in Burma peaked in 2008, and has been declining since then. By contrast, steady and consistent growth occurred in the ASEAN region, as can be seen in Figure 57 below. This suggests that Burma lacks the capacity to transport as many passengers as it should, and also that other means of transport (for example, buses and cars) are becoming more attractive.

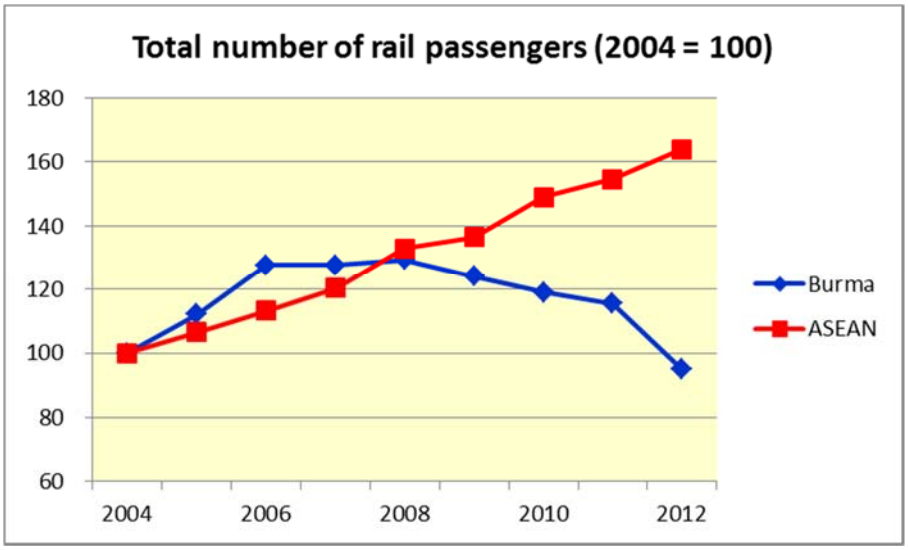

Figure 57: The total number of passengers in Burma compared to the ASEAN region.

[236] *ASEAN-Japan Transport Partnership*, (2013, December), *op. cit*.

By contrast, in terms of rail passenger-kilometres, up until 2011 Burma was performing in line with the ASEAN region, but has fallen sharply in 2012, as can be seen in Figure 58.

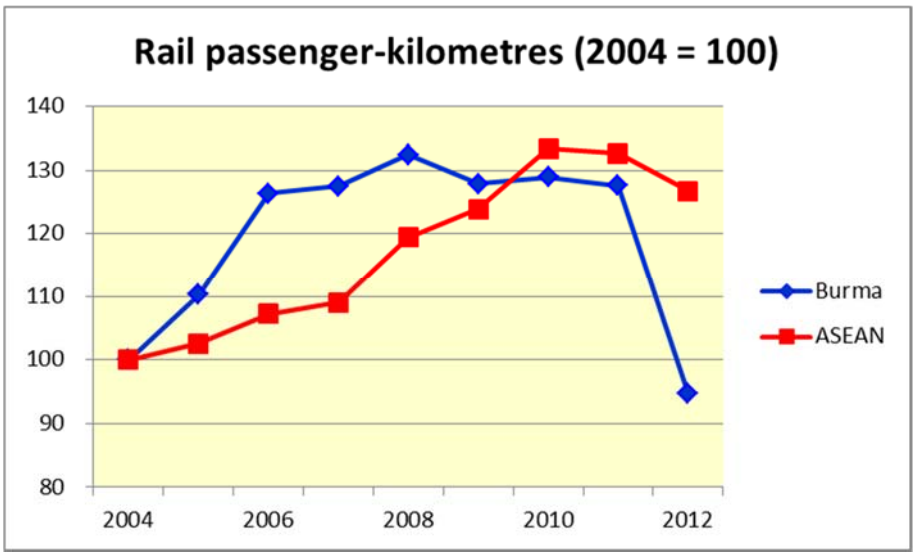

Figure 58: Railway passenger-kilometres in Burma and the ASEAN region.

The results for freight are surprising, with Burma growing faster than the ASEAN region for both freight and freight kilometres, as can be seen in Figures 59 and 60.

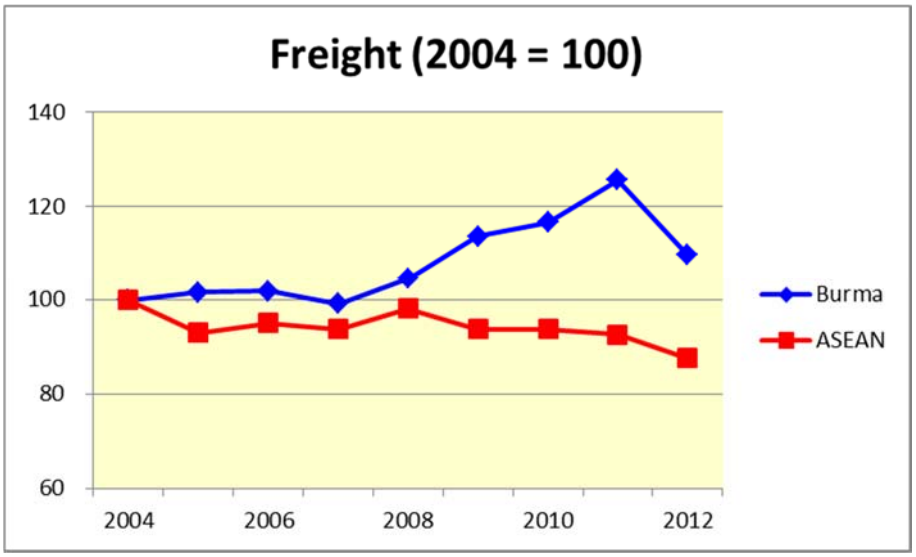

Figure 59: Relative performance for freight in Burma and the ASEAN region.

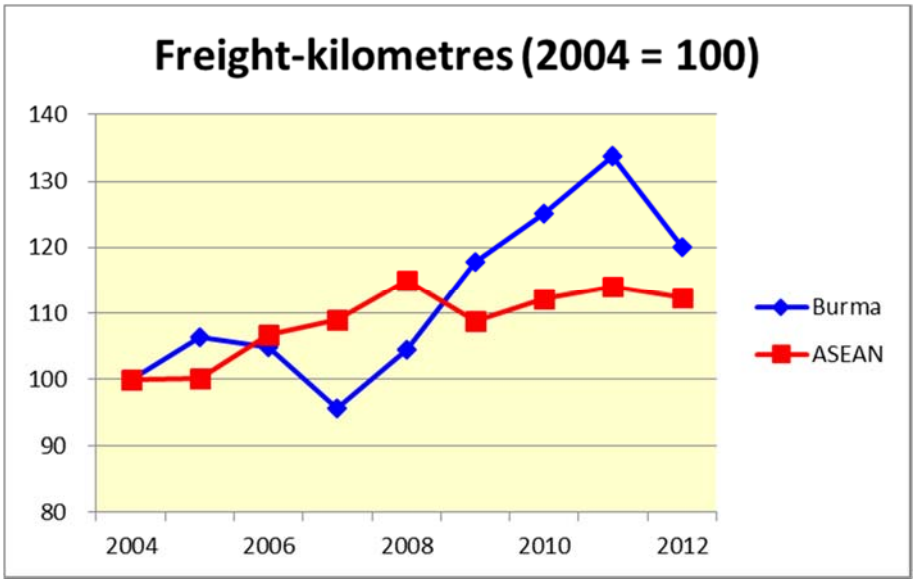

Figure 60: Relative performance for freight-kilometres for Burma and the ASEAN region.

The results for total route length are shown in Figure 61.[237]

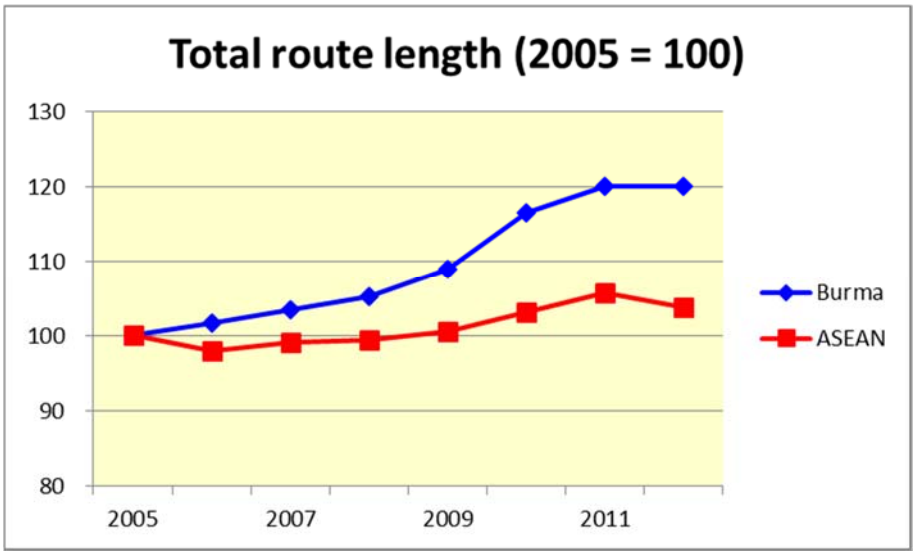

Figure 61: Relative growth of route length in Burma compared to the ASEAN region.

From 2005 route length in the ASEAN region has grown by just 4%, whereas in Burma it has grown by 20%.[238] This can be attributed to the recent construction of new lines in Burma that are unfortunately of poor quality (e.g. the Kyangin-Pakokku line or the Pathein-Einme line). The quality of railway lines is not reflected in the data. For example, the metropolitan lines in Singapore, Bangkok and Kuala Lumpur are far superior to the Circular Railway in Yangon.

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[237] The graph in Figure 61 starts from 2005 as there is no recorded route length for Vietnam in the database in the ASEAN-Japan Transport Partnership.

[238] The route length in ASEAN ex-Burma fell by 2% during the same period.

For passenger coaches, Burma has grown in line with the ASEAN region as can be seen in Figure 62.

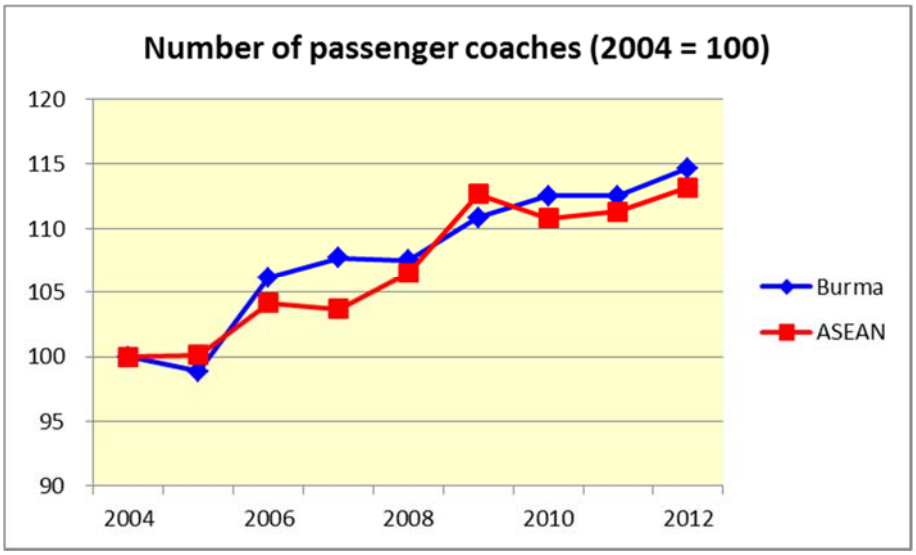

Figure 62: The relative number of passenger coaches in Burma and the ASEAN region.

However one must be cautious in discussing this data, as for Burma there is a major discrepancy in what Ministry of Rail Transportation and the ASEAN-Japan Transport Partnership reported as the number of coaching vehicles, compared to what is recorded in the Statistical Yearbook, as can be seen in Table 40.

Year	Statistical Yearbook (2008 to 2015)	Ministry of Rail Transportation Presentation (February 2013)	ASEAN-Japan Transport Partnership
2001	861		
2002	817		
2003	827		
2004	829		1,117
2005	853		1,104
2006	876		1,186
2007	1,003		1,203
2008	1,017	1,211	1,201
2009	1,030	1,209	1,238
2010	818	1,246	1,257
2011	823	1,238	1,257
2012	866	1,277	1,281
2013	877	1,281	

Table 40: Conflicting data on the number of passenger coaches in Burma.

Data from the Statistical Yearbook and the Ministry of Rail Transportation presentation are for the year ended 31st March, whereas the data from the ASEAN-Japan Transport Partnership are for the year ended 31st December. If one moves the last column of data down by one year, it is consistent with the data from the

Ministry of Rail Transportation. The various types of coaches being used by Myanma Railways as at 31st December 2012 are shown in Table 41.[239]

Type of coach	Number
Upper Class	333
Ordinary Class	674
Mail Vans	13
Brake Vans	127
Restaurants	24
Departmental	82
Others	28
Total number of passenger coaches	**1,281**

Table 41: The various types of coaches on Myanma Railways.

The differences between the data in Table 40 above and the data in the *Statistical Yearbooks 2015* may be definitional ones, i.e. what is classified as a passenger coach. However, even if one just counts Upper Class and Ordinary Class coaches, in the data from the Ministry of Rail Transportation presentation there are 1,007 such coaches as at 31st December 2012, whereas the *Statistical Yearbook 2015* has only 866 as at 31st March 2012 and 877 as at 31st March 2013.

The final graph to examine is the one for the number of freight wagons, shown in Figure 63.

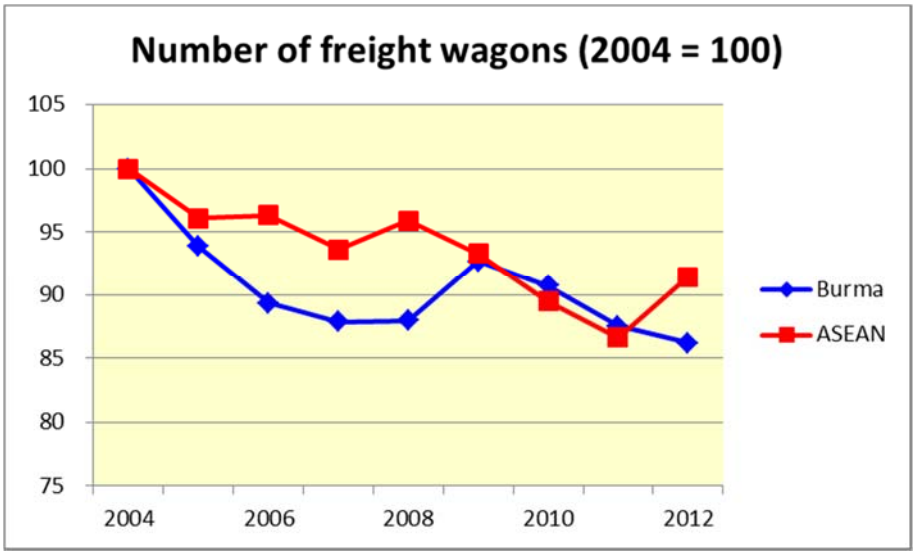

Figure 63: The relative number of freight wagons in Burma and the ASEAN region.

The number of freight wagons has been declining as discussed earlier in this chapter, but what is surprising is that the figure for the ASEAN region is falling at

[239] *Ministry of Rail Transportation*, (2013, February 1), *op. cit.*

a similar rate. However one must also be cautious in discussing this data, as for Burma there is a major discrepancy in what the Ministry of Rail Transportation and the ASEAN-Japan Transport Partnership recorded as the number of freight wagons, compared to what is recorded in the Statistical Yearbook, as can be seen in Table 42.

Year	Statistical Yearbook (2008 to 2015)	Ministry of Rail Transportation Presentation (February 2013)	ASEAN-Japan Transport Partnership
2001	3,412		
2002	2,977		
2003	2,969		
2004	2,972		3,698
2005	2,774		3,471
2006	2,716		3,304
2007	2,647		3,248
2008	2,592	3,249	3,252
2009	2,595	3,252	3,427
2010	1,686	3,427	3,355
2011	1,439	3,331	3,236
2012	1,454	3,236	3,188
2013	1,464	3,204	

Table 42: Conflicting data on the number of freight wagons in Burma.

As was discussed for passenger coaches above, if one moves the last column of data down by one year it is consistent with the data from the Ministry of Rail Transportation. The various types of freight wagons being used by Myanma Railways as at 31st December 2012 are shown in Table 43.[240]

Type of wagon	Number
Covered wagon	1,182
Open wagon (low-sided)	610
Open wagon (high-sided)	397
Timber	523
Wagon	249
Tank wagon	99
Brake van	79
Departmental	55
Total number of freight wagons	**3,194**

Table 43: The various types of freight wagons on Myanma Railways.

The data in the Statistical Yearbook appears to be discounting the number of four-wheeled freight wagons. If one were to use the data recorded in the Statistical

[240] *Ibid.*

Yearbook, then Burma would be significantly underperforming compared to the ASEAN region for the number of freight wagons in use.

3.11 Conclusion - What has Happened over the Last Two Decades?

Statistics can reveal many things, and that is certainly the case for Myanma Railways. In this chapter, data have been examined for the period 1820 to 2015, with the production of paddy being the item going back to 1820. Most of the data considered date from after World War II. The two tables below look at a more recent period, the twenty-six year period from 1989 to 2015. This period is chosen in order to be more contemporary, and also because 1989 is the year after the political turmoil in Burma in 1988.

	1989	2015	Growth Over 26 Years	Growth Over 26 Years as % p.a.
Railways				
Passenger numbers (000's)	36,689	47,883	31%	1.0%
Passenger-miles (000's)	1,870,125	2,122,743	14%	0.5%
Freight (000's tons)	1,269	2,280	80%	2.3%
Freight ton-miles (000's ton-miles)	196,579	504,759	157%	3.7%
Inland Waterways				
Passenger numbers (000's)	14,552	12,287	-16%	-0.6%
Passenger-miles (000's)	344,599	96,951	-72%	-4.8%
Freight (000's tons)	2,052	1,787	-13%	-0.5%
Freight ton-miles (000's ton-miles)	264,359	282,353	7%	0.3%

Table 44: Growth rates for the railways and inland waterways over the last 26 years.

The figures in Table 44 show that the passenger numbers on the railways grew by about 1.0% p.a. and freight by about 2.3% p.a. The trend for the inland waterways was negative, with passenger numbers falling on average by 0.6% p.a. and freight by 0.5% p.a.

Table 45 tells a different tale for the railways.[241]

[241] To calculate a percentage change per annum is not meaningful for the three items where the fall from 1989 to 2015 is close to 100%.

	Units	1989	2015	Growth over 26 years	Growth over 26 years as % p.a.
Length of the railways					
Track mileage	Miles	2,816	4,933	75%	2.2%
Route mileage	Miles	1,998	3,795	90%	2.5%
Railway stations					
Railway stations		475	960	102%	2.7%
Number of locomotives					
Steam		135	-	-100%	
Diesel		252	377	50%	1.6%
Total number of locomotives		387	377	-3%	-0.1%
Tractive effort of the locomotives					
Steam	000's lbs	2,662	-	-100%	
Diesel	000's lbs	10,228	13,150	29%	1.0%
Total tractive effort	000's lbs	12,890	13,150	2%	0.1%
Passenger coaches					
Coaching vehicles		1,314	965	-27%	-1.2%
Total seating capacity		51,086	40,110	-21%	-0.9%
Goods wagons					
Four-wheeled		5,212	11	-99.8%	
Bogies		2,174	1,800	-17%	-0.7%
Total number of goods wagons		7,386	1,811	-75%	-5.3%
Carrying capacity of the goods wagons					
Four-wheeled	Tons	85,898	-	-100.0%	
Bogies	Tons	65,066	57,600	-11%	-0.5%
Total carrying capacity of the goods wagons	Tons	150,964	57,600	-62%	-3.6%

Table 45: Growth rates for Myanma Railways.

Route length, track length and the number of stations are growing at approximately similar rates. The length of track has been growing by 2.2% p.a. and the number of stations by 2.7% p.a. However, most other figures are declining or flat:

- The number of locomotives has declined slightly, with numbers at 387 in 1989 and only 377 in 2015, the key difference being that steam locomotives have been replaced by diesel ones. The total tractive effort was virtually flat as well.
- The number of passenger coaches fell by 1.2% p.a. and seating capacity by 0.9% p.a., despite passenger numbers being up by 1.0% p.a. The result is overcrowding.
- The number of goods wagons fell by 5.3% p.a. and their carrying capacity fell by 3.6% p.a. Myanma Railways was not investing for the future. Despite this, the volume of freight grew by 2.3% p.a.

It is clear from my own observations over several years and from the statistical data examined in this chapter, that there is much room for improvement in the operation of Myanma Railways, together with much greater investment in all aspects of the railway system. As noted in Chapter 1, the amount being allocated in the national Budget of Myanmar for railways is quite small. By contrast, China is investing heavily in railways, investing US$43 billion (265 billion Yuan) in the first six months of 2015, an increase of 12.7% over the same period on 2014.[242] Over 2,200 kilometres of new track has been built, with China seeing it as a way of bolstering a slowing economy. Indeed, railway investment is one of seven prioritised areas of investment for China. A similar commitment, on a much smaller scale of course, is needed from the government of Burma.

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[242] *Xinhua News Agency*, (2015. July 23), "China H1 rail investment tops 43 bln USD". Retrieved from: http://news.xinhuanet.com/english/2015-07/23/c_134441188.htm.

Chapter 4

BY RAIL TO KYAUKPHYU?
THE CHINA-BURMA RAILWAY

4.1 Introduction

The idea of a China-Burma railway was discussed in the United Kingdom from 1863 onwards.[1] In the late 1800's studies were made into the feasibility of building a railway from central Burma to western China.[2] The Yunnan-Burma Railway was a British project to connect Yunnan Province in south-west China to Burma, which had been under British rule since 1885. Lord Curzon, who was Viceroy of India from 1899 to 1905, quashed the idea on commercial grounds, considering it to be "mid-summer madness".[3] His view was that:[4]

> *I cannot advise that, in the pursuit of fanciful political ambitions, we should use Indian money to spread-eagle our railways over foreign countries and remote continents, while all the time there is lying the most splendid and lucrative investment at our doors.*

Lord Curzon is credited with having stopped the railway in Burma at Lashio with the comment that the entire Burma-Chinese trade at the frontier ferry where the railway was to cross could be transported in two dugout canoes.[5] Today the railhead is still at Lashio, although a line that is no longer in use has been built for a few miles beyond it. The connection of India and Burma at the time was seen as a strategic and political necessity, but Lord Curzon was opposed to this line for commercial reasons.[6]

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[1] Harvey, G.E., (1946), "British Rule in Burma 1824-1942", Faber and Faber, London, p.43.

[2] Rastorfer, (1992), *op. cit.*; and

Bugrova, (2007), *op. cit.*

[3] Fraser, Lovat, (1911), "India Under Curzon & After", William Heinemann, London, p.313.

[4] *Ibid*.

[5] Harvey, (1946), *op. cit.*; and

Fraser, (1911), *op. cit.*; and

Christian, John LeRoy, (1945), "Burma and the Japanese Invader", Thacker & Company, Limited, Bombay, p.211.

[6] Fraser, (1911), *op. cit.*, p.314.

In the early 1920's Sun-Yat Sen, the first president of China, had visions for railway expansion to link China with the rest of the world. This included a line from Yunnan Province in south-west China to the Arakan Coast.[7] Nearly one hundred years later, this line may finally be built by China, following the route of the oil and gas pipelines that have been recently constructed. By 2011, the planned line to the Bay of Bengal was receiving attention in the press, with the general view being that China would go ahead with the rail link to Burma.[8] Seven years later the plans are stalled and whether the line will go ahead in the near future is problematic.

4.2 Yunnan-Burma Railway

There has only been one attempt so far at building a China-Burma railway. This was a railway known as the Yunnan-Burma Railway that the Chinese and the Americans started to build in the early 1940's. It had been formally proposed in August 1937 by the Governor of Yunnan, General Long Yun, who recommended that the Burma Road and the Yunnan-Burma Railway be built at the same time to counter the blockading of the Chinese coastal areas by the Japanese.[9] Long Yun's recommendations were approved by Chiang Kai-shek. In November 1941, just before the outbreak of war in the Pacific, the Americans held high hopes that this line would be completed. The Burma Road, from Lashio to Kunming, had been completed and was in use. The next major undertaking was to link Kunming in south-west China by rail to Lashio in Burma, the railhead of the line from Rangoon.

A good first-hand description of the work on the Yunnan-Burma Railway is given by George Rodger, a US photojournalist for *Life Magazine* during World War II.[10] Rodger visited the construction sites for the railway in Yunnan Province and met Dr Tseng-Yang-fu, the Chief Engineer and Director-General of the Yunnan-Burma Railway Company.[11] Dr Tseng Yang-fu was the driving force from

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[7] Sun Yat-Sen, (1920), *op. cit.*

[8] Mohan, (2011, September 1), *op. cit.*

[9] Cheng, Li, (2010, July), "The Yunnan --- Burma Highway and Yunnan Economy during the Periods of Anti-Japanese War", Asian Culture and History, Vol.2, No. 2, July 2010. Retrieved from: http://www.ccsenet.org/journal/index.php/ach/article/view/6600.

[10] Rodger, George, (1943), "Red Moon Rising", The Cresset Press, London, pp.17-33.

[11] Dr Tseng Fang-yu was a former Vice-Minister for Railways in China. See:

The Sydney Morning Herald, (1941, October 10), "China's New Life-Line. Start on the Burma Rail Link. Easing Strain on the Road." Retrieved from: http://trove.nla.gov.au/ndp/del/article/17768276.

the Chinese side of the construction team.[12] From the Chinese point of view, the motivation for the railway (from Kunming in China to Lashio in Burma, a distance of 346 miles) was to bring war supplies to China for Chiang Kai-shek's armies, relieving traffic on the Burma Road. He hoped that after the war the railway would carry trade goods (such as jade, silk, spices) which for hundreds of years had been carried by pack mules to Bhamo on the Irrawaddy River in Burma.[13] Dr Tseng Yang-fu had lobbied for the railway in the early 1930's:[14]

> *Thus China viewed the future of her railway, which, but for the sluggish short-sighted of British Colonial policy and the overwhelming transportation companies operating in Burma, would have started ten years ago when Tseng Yang-fu first went to London to fight for a right to build it, not only into Burma, but right across the Naga mountains to connect with the railway network in eastern India.*

Dr Tseng Yang-fu employed 250,000 Chinese coolies, both men and women, and there were many deaths from both disease and accidents. An article in the *San Francisco Chronicle* in November 1941 described the pending construction of a railway as a miracle, facing obstacles similar to those that the construction of the Burma Road had faced.[15] Dr Tseng Fang-fu had an initial timeline of twelve to fifteen months for completion, with a target date of December 1942.[16] A major threat was malaria, and health officials were seconded from the US Public Health Department. American engineers were overseeing the construction. The technique for building railways in the US and Canada (e.g. the Canadian Pacific Railway) was to keep extending the line. The approach in Burma on the line was different, with small sectors being built, with tunnels, bridges and roadbed (i.e. ballast) in place. The plan was then to lay the track to join the sectors up. The photograph in Plate 37 shows a section of the railway under construction in Yunnan Province.[17]

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[12] Rodger visited Yunnan Province in early 1942.

[13] Rodger, (1943), *op. cit.*, p.32.

[14] *Ibid*., p.33.

[15] Gunnison, Royal Arch, (1941, November 27), "Construction Miracle: China's Yunnan Burma Railroad", San Francisco Chronicle. Retrieved from: http://spec.lib.vt.edu/mss/pdf/wright_daniel_ms68_007/pdf/box2folder5.pdf.

[16] *Ibid*.

[17] Outram, Frank and G.E. Fane, (1940, November), "Burma Road, Back Door to China", The National Geographic Magazine, Volume LXXVIII, No. 5, pp.629-658.

Plate 37: A section of the Yunnan-Burma Railway under construction, circa 1940.

The plan was to link up with the Lashio to Mandalay line, famous for the Gokteik Viaduct that was constructed by American engineers in 1902.[18] Photographs of the viaduct are shown in Plate 38 (early 1920's) and in Plate 39 (*circa* 1940).[19]

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[18] Talbot, Frederick A., (1914), "Railway Wonders of the World", Waverley Book Company, London. See the article entitled "Some Notable Bridges. How Engineers have Triumphed over Nature", pp.667-678 in Volume IV.

[19] Plate 38 is sourced from:

Rowe & Co., Ltd., (1922), "Typical Photographs of Burma. Burmese Life and Scenes", Rowe & Co., Ltd., Rangoon, p.62.

Plate 39 is sourced from:

Outram and Fane, (1940, November), *op. cit.*

This photograph was taken by Mr G.L.G. Samson, a Special Correspondent with Associated Press of America during World War II, and appears in Outram & Fane's article.

Plate 38: The Gokteik Viaduct, in the early 1900's.

Plate 39: The Gokteik Viaduct, *circa* 1940.

Another first-hand description of the construction work that was carried out on the Yunnan-Burma railway is given by Major John Ausland, from the U.S. Army Corps

of Engineers.[20] Ausland was a railway construction expert and was assigned by the Americans as an advisor to the Chinese officials (especially Dr Tseng Fang-yu).[21]

China's decision to build the Yunnan-Burma railway was triggered by Japanese expansion on China's eastern seaboard in the 1930's. China decided to build supply routes in the west, both road and rail, and made plans to develop old imperial hinterland caravan routes into modern roads, with the aim of importing supplies and munitions for defence purposes.[22] The road would follow a thousands-of-years-old route known as the Old Tribute Road or Ambassador's Road.[23] The section from Kunming to Lashio is the famous Burma Road, construction of which commenced in 1937.[24] The route of the Burma Road is shown in Map 6.[25]

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[20] Ausland, John E., (1994), "The Last Kilometer and Other War Stories", Land Productions, Oslo, Norway, pp.13-94.

[21] Anders, Leslie, (1965), "The Ledo Road. General Joseph W. Stillwell's Highway to China", University of Oklahoma Press, Norman, pp.6-7.

[22] Feng, C.T. (1939, September 8), "China and Her Back Door. Its Significance to the World". A speech delivered by C.T Feng, Consul of China to San Francisco. Delivered at the Commonwealth Club on 8th September 1939. Sourced from: "Vital Speeches of the Day", Vol. VI, pp.42-45. Retrieved from: http://www.ibiblio.org/pha/policy/1939/1939-09-08a.html.

[23] The route was known as the Old Tribute Road or the Ambassador's Road because Burmese principalities would use this road to offer tributes to the Chinese emperors. See:

Outram and Fane, (1940, November), *op. cit.*; and:

Mui, King-Cha, (1940, November 28), "Burma Road and Its Significance to the World", A speech delivered by King-Chau Mui, Chinese Consul-General at Honolulu, over the radio from Hilo, Hawaii on 28th November 1940. Sourced from "Vital Speeches of the Day", Vol. VII, pp.151-153. Retrieved from: http://www.ibiblio.org/pha/policy/1940/1940-11-28a.html; and

Life Magazine, (1940, July 29), "Japan Forces Burma to Close Burma Road", pp. 140-143.

[24] It was thought at one stage in 1941 that a Japanese attack on the Burma Road could trigger a Pacific War. See:

Life Magazine, (1941, December 8), "Burma Road. Japan Threatens to Close China's Only Supply Line", Volume 11, No. 43, pp.140-143.

[25] *Life Magazine,* (1940, July 29), *op. cit*.

Map 6: The Burma Road.

The plan was for the railway to follow an alignment planned by Major H.R. Davies from the British Army, who had surveyed Yunnan Province over 40 years earlier. Once construction started, it followed almost exactly the alignment that had been suggested by Davies. As well as being a British army officer, Davies was a member of the British intelligence service. He was asked by the British government to lead survey expeditions into Yunnan Province between 1894 and 1900.[26] The purpose was to find possible routes for a railway between Burma, which was under British control, and Yunnan Province. The plan was to connect Burma to the Yangtze River and then go further to Sichuan. Davies published details of his travels in 1909.

Fitzgerald described the state of construction of the line in an address to the Royal Geographical Society in 1940.[27]

> *At this village, Ch'ing Hua Tung, the line of the Burma-Yunnan Railway, which the Chinese are now constructing, diverges from that of the motor road. From K'un Ming to Ch'ing Hua Tung the railway will follow the line of the road in so far as the necessity of tunnelling the mountains will permit, but from here the railway will turn south to Meng Hua and Mi Tu, and thence by Yun Chou to the Kunlong ferry on the Salween, which is at that point the frontier of Burma and Yunnan. This route is some 100 miles south of the road …. The proposed*

[26] Davies, Henry Rodolph, (1909), "Yün-nan: The Link Between India and the Yangtze", Cambridge University Press.

[27] Fitzgerald, Patrick, (1940), "The Yunnan-Burma Road", The Geographical Journal, Vol. XCV, No. 3, March 1940, pp.161-171.

route is by far the easiest way, as it avoids three of the mountain ranges and crosses the Mekong and Salween where those rivers are more easily accessible.

It will not be surprising if the modern-day railway builders in China follow the same route.

Planning ahead, twenty-five steam engines were ordered from the US company ALCO in 1941. These were Mallet-type articulated steam locomotives and were relatively small locomotives, similar to ones already being used by Burma Railways [28]. A diagram of a typical 2-8-8-2 locomotive is shown in Figure 64.[29]

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[28] The term "articulated locomotive" usually refers to a steam locomotive with one or more engine units that can move independently of the main frame. Articulated locomotives were very well-suited to mountainous regions with sharp curves. See:

Wikipedia website, "Articulated locomotive". Retrieved from: https://en.wikipedia.org/wiki/Articulated_locomotive; and

Railway Wonders of the World website, "Articulated Locomotives. Their Evolution and Advantages". Retrieved from: http://www.railwaywondersoftheworld.com/articulated-locos.html; and

Beyer, Peacock & Co. Ltd., (2013), " 'Garratt' Articulated Locomotives", Heimburger House Publishing Company, Illinois, USA, p.23 and p.27. (This is a reprint of a catalogue published by Beyer, Peacock & Co. Ltd. *circa* 1925); and

Winchester, Clarence, (ed.), (1935-1936), "Railway Wonders of the World", Volumes 1 and 2, consisting of 50 parts published weekly from February 1935 to January 1936. Published by The Amalgamated Press, London. See:

"Hill Lines of India. Construction and Operation of Some Steeply Graded Routes", pp.826-833, in Part 26; and

"Burma's Metre-Gauge System. Developing the Resources of a Rich Territory", pp.1329 -1331, in Part 42.

[29] This drawing is from the collection of John Stutz. It is sourced from the following website:

Pryor, Bruce, "Narrow Gauge Pictures From Off The Beaten Track". Retrieved from: http://narrowmind.railfan.net/2882_113_DRGW.JPG.

The description of this steam locomotive as "2-8-8-2" is an example of a usage of the Whyte notation used for classifyiing steam locomoives based on their wheel arrangement. This notation was developed by Frederick M. White and was used in the early twentieth century. In this case "2-8-8-2" is used to describe an articulated locomotive with a two-wheel leading track, two sets of eight driving wheels, and a two-wheel trailing track. See:

The Railway Technical website, "Steam Glossary". Retrieved from: http://www.railway-technical.com/glossary/steam-glossary.html; and

Wikipedia website, "Whyte Notation". Retrieved from: https://en.wikipedia.org/wiki/Whyte_notation; and

Wikipedia website, "2-8-8-2". Retrieved from: https://en.wikipedia.org/wiki/2-8-8-2.

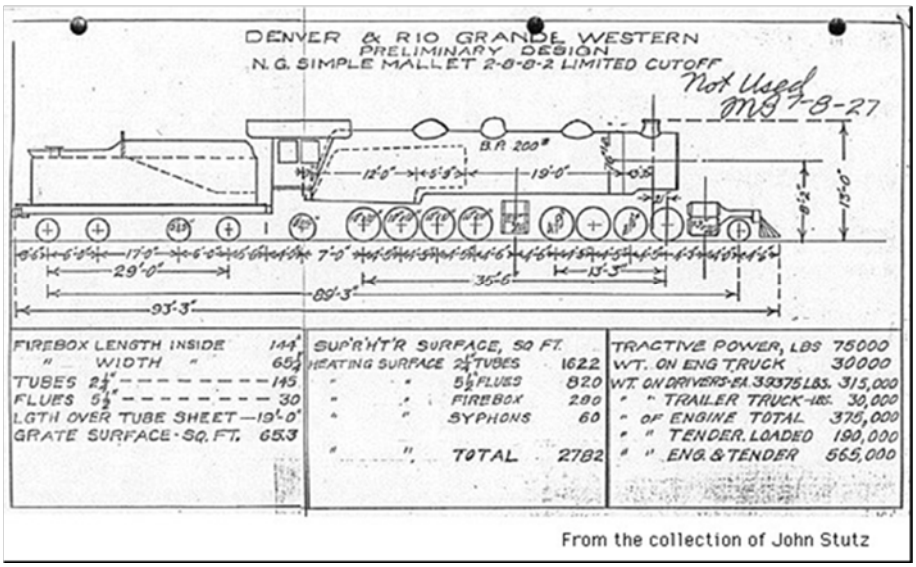

Figure 64: A diagram of a 2-8-8-2 steam locomotive, of the type that was to be used on the Yunnan-Burma Railway.

The invasion of Burma by the Japanese Fifteenth Army in 1941 and its advance into northern Burma in early 1942 put paid to the construction of the line between Yunnan in China and Lashio in Burma, a line that has remained unbuilt to this day.

The current network for the Burmese railway system was mostly built by the British. The Rangoon and Irrawaddy State Railway ran from Rangoon to Prome (now Pyay) and was opened in 1877.[30] The next major line was from Rangoon to Pyinmana, which was built in 1888, and extended to Mandalay and then to Myitkyina in 1898.[31] Branch lines were built to Lashio and Martaban (now Moktama) in 1910. In 1921 a branch line was built to Shwe Nyaung, near Inle Lake. A number of smaller lines were also built, coming off from the main north-south line. The lines reached close to China, namely to Lashio and Myitkyina, but never went to the border with China. At the time of construction, the intention was that the line to Lashio be extended to the Kunlôn Ferry on the Salween River that was on the border with China.[32] The route was surveyed as far as the Kunlôn Ferry but monetary reasons as well as the physical difficulty of constructing the line

[30] *The Graphic*, (1877, June 23), "The First Railway in British Burmah – Opening of the Rangoon and Irrawaddy State Railway at Rangoon", p.601.

[31] Scott, Sir J. George, (1906), "Burma: A Handbook of Practical Information", Alexander Moring Ltd., London, pp.303-306.

[32] *Ibid.*, p.305; and

White, Herbert Thirkell, (1923), "Burma", Cambridge University Press, pp.166-169.

put paid to these plans.[33] The line to Lashio was opened in 1903, and at the time there were plans not only to extend it to Kunlôn Ferry but one day as far as the ancient holy city of Tali-fu (near Dali) in Yunnan Province.[34] The route between Burma and Yunnan had been surveyed by the British from 1898-1899, but it was not viable from a commercial point of view. The only strong reason for it was a strategic and political one. Colquhoun, writing in 1900, stated that:[35]

> *It seems clear, in view of the Russian advance southward, that, if British influence is to be asserted in the Yangtsze region, the connection of the Upper Yangtsze by rail with Burma must be undertaken and carried out without delay.*

In the end, the political and strategic reasons were not strong enough and the line was built neither to the Kunlôn Ferry nor into Yunnan Province in China.[36] It was more commercially sensible to develop the existing rail and river transport systems in Burma rather than build the new line into and across Yunnan Province.[37]

It is interesting to ponder today how strong the commercial reasons are *versus* strategic and political reasons for building this line from China to Burma. Perhaps like in 1900, from a Burmese perspective, it would be better to concentrate on improving the existing railways and waterways in Burma rather than building a China-Burma railway.

4.3 The Proposed New Railway to Kyaukphyu

Over one hundred years after first being planned and more than seventy years after construction was aborted due to World War II, momentum is growing for this rail link between Burma and China to be built. The first sign of this came in 1985, when Pan Qi, the former Vice-Minister for Communications in China proposed that

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[33] Shakespear, L.W., (1914), "History of Upper Assam, Upper Burmah and North-Eastern Frontier", Macmillan and Co., Limited, London, p.255.

[34] Scott, (1906), *op. cit.*, p.305.; and

White, (1923), *op. cit.*, p.166; and

Little, Archibald, (1905), "The Far East", Oxford at the Clarendon Press, pp.124-125.

[35] Colquhoun, Archibald R., (1900), "The 'Overland' to China", Harper & Brothers, London and New York, p.335, and pp.412-417.

[36] Chandran, J., (1971), "THE BURMA-YUNNAN RAILWAY: Anglo-French Rivalry in Mainland Southeast Asia and South China, 1895-1902", Center for International Studies, Ohio University.

[37] Colquhoun, (1900), *op. cit.*.

the Irrawaddy Corridor be opened up using a combination of road, rail, and river transport, as well as new harbour infrastructure.[38]

Thirty years after the original proposal by Pan Qi, the concept of a corridor through Burma is very much on China's agenda. Lintner referred to this as "China's 'Myanmar Corridor' ", a corridor that runs through Burma from Yunnan Province to the Bay of Bengal.[39] Linter's view was that:

> *With its strategic location between South and Southeast Asia, and between the Chinese hinterland and the Bay of Bengal, Myanmar has long been important to China. China has always interfered in Myanmar's internal affairs and most probably always will. In the past it was to export world revolution; today it is trade and commerce. With a different emphasis, "the Myanmar corridor" remains of utmost importance to China's policy makers.*

China's first priority for the corridor was the gas and oil pipelines that have now been built. The China-Burma Railway is of lower priority. Lintner discussed the invitation by China to Aung San Suu Kyi to visit China in June 2015 where she met President Xi Jinping.[40] Lintner considered it to be a case of China keeping its options open for the future in case Aung San Suu Kyi's achieved power. Lintner saw China's aim as being to secure what he described as "*the vital 'Myanmar corridor' ".*[41]

In April 2011, China and Burma signed a Memorandum of Understanding for the railway to be built. It was proposed that the line be built in five stages with the line being over 1,215 kilometres in length. It was also proposed that the listed company, China Railway Group, would build the line from Yunnan Province to Kyaukphyu on the Arakan Coast. China Railway Group is a subsidiary of the state-owned China Railway Engineering Corporation (CREC). [42] All the production and operation businesses of CREC are within the China Railway Group.

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[38] Pan Qi, (1985, September 2), *op. cit*.

[39] Lintner, Bertil, (2015, July 13), "Same Game, Different Tactics: China's 'Myanmar Corridor' ", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/magazine/same-game-different-tactics-chinas-myanmar-corridor.html.

[40] Forsythe, Michael, (2015, June 11), "Aung San Suu Kyi of Myanmar Meets with Xi Jinping in Beijing", The New York Times. Retrieved from: http://www.nytimes.com/2015/06/12/world/asia/aung-san-suu-kyi-of-myanmar-meets-with-xi-jinping-in-beijing.html?_r=0.

[41] *Ibid*.

[42] *Reuters*, (2011, April 28), "Myanmar, China agree cross-border rail project." Retrieved from: http://www.reuters.com/article/2011/04/28/myanmar-china-rail-idUSL3E7FS4CJ20110428.

The railway was to start from Ruili East Station in Ruili in Yunnan Province in China (see Map 7).[43]

Map 7: Yunnan Province in south-west China.

This station is a part of the Kunming-Dali-Ruili Railway that is currently under construction.[44] The line would then cross the Shweli River to Muse in Burma, then head south-west to Kyaukphyu, following the route of the oil and gas pipelines. A possible route for this line is shown in red in Map 8 on the next page.[45]

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[43] The Ruili Border Economic Co-operation Zone is located at Ruili which is regarded as a border hub. The Yunnan government is keen that this zone be developed further. See:

Boehler, Patrick, (2012, September 24), "Thein Sein Concludes China Visit", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/burma/thein-sein-concludes-china-visit.html; and

China Daily, (2010, July 29), "Ruili Border Economic Cooperation Zone". Retrieved from: http://www.chinadaily.com.cn/m/dehong/2010-07/29/content_11068226.htm.

Map 7 is sourced from:

Yunnan Adventure website: Retrieved from: http://www.yunnanadventure.com/YunnanOverview/Yunnan-Maps.html.

[44] Yun Sun, (2014, August 14), "China, Myanmar: stop that train", Asia Times. Retrieved from: http://www.atimes.com/atimes/Southeast_Asia/SEA-01-140814.html.

[45] This map is sourced from:

Hettler, (2013, August), *op. cit.*

Map 8: Possible route of the China-Burma Railway.

The start of the construction of the line was officially launched in May 2011 in a ceremony in the Chinese border town of Ruili, which is on the Chinese side of the Shweli River across the border from Muse in Burma.[46] The plan was for the Chinese to build a double-track railway from Ruili to Dali, where it would join the China Rail network that goes to Kunming. The terrain is quite mountainous in this part of Yunnan Province, and over three quarters of the line would be in either tunnels or cuttings.

The plan was for the line from China to Kyaukphyu to be suitable for a maximum operating speed of 140 km/hr. China Rail hoped to transport over 12 million tonnes of freight per year on this line. The gauge in China is standard gauge (1,435 *mm*) compared to the metre gauge in Burma. If the line is ever built it will be standard gauge, thus avoiding a break of gauge at the border. The Burmese government is already anticipating that standard-gauge lines will be built through the country, and is manufacturing concrete sleepers that are suitable for both standard gauge and metre gauge.[47]

Interestingly China also had plans in 2013 for a line to Myitkyina in northern Kachin State in Burma. The Kunming-Dali-Ruili line will pass through Baoshan, a city 112 miles east of Myitkyina. It was planned to have a line branching off from Baoshan, passing through Tengchong to Myitkyina.[48] These plans are not new. In 1995 Mr Cheng Zhengning, a deputy from the National People's Congress, proposed not only that this line be built, but also that it extend over 2,100 kilometres to Calcutta in India.[49] Indeed, such a line had been suggested by the Chinese as far back as 1911. This was one of two lines proposed joining Burma and India.[50] The line that was being proposed by China was one that cuts across northern

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[46] *Railway Gazette*, (2011, June 16), "China starts work on line to Myanmar". Retrieved from: http://www.railwaygazette.com/nc/news/single-view/view/china-starts-work-on-line-to-myanmar.html.

[47] *The Global New Light of Myanmar*, (2015, January 28), "Amyotha Hluttaw discusses parental leave and business in ethnic armed group areas. Retrieved from: http://www.burmalibrary.org/docs20/GNLM2015-01-28-red.pdf.

[48] *Canada Tibet Committee,* (2013, March 13), "China proposes railway to Burma, India (UPI)". Retrieved from: http://www.tibet.ca/cms/en/library/wtn/archive/old?y=1995&m=3&p=13-2_6; and

McCartan, (2011, January 8), *op. cit.*

[49] *World Tibet Network News*, (1995, March 13), "China proposes railway to Burma, India (UPI)". Retrieved from: http://www.tibet.ca/en/newsroom/wtn/archive/old?y=1995&m=3&p=13-2_6.

[50] *Indian Railways Fan Club* website, "Are there rail connections to China or Burma (Myanmar) from the northeast of India?" Retrieved from: http://irfca.org/faq/faq-inter.html; and

McCartan, (2011, January 8), *op. cit.*

Burma to Myitkyina and then onto Lekhapani in Assam in India.[51] The second line is the one preferred by India, starting from Jiribam in Manipur and going via Imphal to Moreh on the Burmese border. There it will link to a line planned in Burma to Tamu, which is across the border from Moreh, which the Indian government has regarded in recent years as its gateway to Southeast Asia.[52] The construction of the line from Jiribam to Imphal is well underway. This line is 111 kilometres long and was expected to be completed by 2016, but this is unlikely due to construction problems (terrain and insurgency issues).[53] There has been no further mention in the press in recent years of a line from China to Myitkyina.

If the Kunming-Kyaukphyu line is ever built, it is quite possible that a standard-gauge branch line (branching off at Mandalay, possibly following the current alignment to Monywa and Kalaymyo) could be built to Tamu on the Burma/India border. From Tamu it would link into the broad-gauge network in India, when a line from Imphal to Moreh is completed.[54] This line from Mandalay to Tamu via Monywa is unlikely to be built in the near-term, and it is even less likely that China will build a line across the top of Burma through Myitkyina. A line from Mandalay to Tamu should not be ruled out in the longer term however. China and India have endorsed the concept of a trade corridor encompassing Bangladesh, China, India

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[51] Lekhapani is at the eastern-most end of the Indian Railways network. Trains now terminate at Ledo, a few miles before Lekhapani.

The famous Stilwell Road was built in World War II and followed a route from Inda to China ocross the northern part of Burma, going from Ledo in Assam in India to Kunming in Yunnan Province in China. It is barely usable today, but China has shown interest in re-opening the route but India is hesitant. The Stilwell Road was 1,736 kilometres long. See

Rahman, Mirza Zulfiqur, (2016, October 11), "The abandoned route through India, Myanmar and China: why the Stilwell Road should be restored", The Conversation. Retrieved from: http://theconversation.com/the-abandoned-route-through-india-myanmar-and-china-why-the-stilwell-road-should-be-restored-65497.

[52] Lees, Graham, (2007, July 19), "Burma is Key to India's 'Look East' Economic Strategy", World Politics Review. Retrieved from: http://www.worldpoliticsreview.com/articles/941/burma-is-key-to-indias-look-east-economic-strategy.

[53] *News Track India*, (2012, May 16), "Imphal-Jiribam railway line: First locomotive test run held". Retrieved from: http://newstrackindia.com/newsdetails/2012/05/16/214-Imphal-Jiribam-railway-line-First-locomotive-test-run-held.html.

This line will be discussed in Chapter 8.

[54] *E-Pao*, (2011, January 10), "China insists on high speed rail link to India through Manipur". Retrieved from: http://e-pao.net/GP.asp?src=10..110111.jan11; and

Fischer, Elisabeth, (2011, December 9), "Full steam ahead Asia", Railway Technology.com. Retrieved from: http://www.railway-technology.com/features/featurefull-steam-ahead-asia/.

and Myanmar (the so-called BCIM Corridor).[55] A pivotal place in this BCIM corridor could be Mandalay, as it would be a key point on any rail or road link between China's Yunnan Province and India.[56] The construction of a standard-gauge railway from Mandalay to Tamu on the border with India will probably rest with the fate of the BCIM Corridor and whether India and China continue to push for it in the future.

4.4 The Significance of Kunming as a Rail Terminus

Historically Kunming has been a key railhead, being one end of the Kunming to Hai Phong Railway that was built by the French from 1904 to 1910. This line was an 854 kilometres-long metre-gauge line and operated at a speed of just 30 km/hr, but is no longer operational.[57] But with China's rail expansion plans well underway, Kunming is set to once more be China's main rail link to Southeast Asia. To cater for the new lines that China hopes to build, including the one to Burma, a major new railway station has been built in Kunming. The station, known as Kunming South New Station, was completed in December 2016 and is the largest passenger railway station in south-west China and has thirty railway lines and sixteen platforms, transporting about 128,000 passengers per day.[58]

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[55] Barlow, Nathan, (2013, June 7), "The Bangladesh-China-India-Myanmar Trade Corridor", Asia Briefing. Retrieved from: http://www.asiabriefing.com/news/2013/06/the-bangladesh-china-india-myanmar-trade-corridor/; and

Lai, Neeta, (2013, November 5), "India and China Seek Economic Integration", Asia Sentinel. Retrieved from: http://www.asiasentinel.com/econ-business/india-china-seek-economic-integration/; and

Uberoi, Patricia, (2013), "The BCIM Forum: Retrospect and Prospect", Institute of Chinese Studies, Delhi, India. Retrieved from: http://www.icsin.org/ICS/WorkingpaperPdf/20.pdf.

[56] Boot, William, (2014, November 10), "Kyaukphyu SEZ: Economic Reality or Pipedream?". The Irrawaddy. Retrieved from: http://www.irrawaddy.org/magazine/kyaukphyu-sez-economic-reality-pipedream.html.

[57] *China Daily*, (2012, August 16), "China completes railway link to ASEAN countries". Retrieved from: http://www.chinadaily.com.cn/cndy/2012-08/16/content_15679632.htm; and

Doling, Tim (2012), "The Railways and Tramways of Viêt Nam", White Lotus Press Co., Ltd., Bangkok, pp.26-35.

[58] Horton, Chris, (2011, November 28), "New Kunming train station to open in 2016", *GoKunming* website. Retrieved from: http://www.gokunming.com/en/blog/item/2499/new_kunming_train_station_to_open_in_2016; and

Railway Gazette, (2016, December 28), "Shanghai – Kunming high speed line completed". Retrieved from: http://www.railwaygazette.com/news/high-speed/single-view/view/shanghai-kunming-high-speed-line-completed.html; and

Wikipedia website, "Kunming South Railway Station". Retrieved from: https://en.wikipedia.org/wiki/Kunming_South_Railway_Station.

The line to Burma is one of three high-speed lines China plans to its neighbouring countries, all starting from Kunming. The three lines are illustrated in Map 9.[59]

Map 9: Railways from Kunming to Burma, Laos and Cambodia.

There is a large element of artistic licence in the drawing of the three lines in this map, but it does highlight how China sees Kunming as the focal point for its railway expansion in Southeast Asia. The three lines intended to be shown in Map 9 are:

1. an eastern line through Vietnam and Cambodia.
2. a southern line through Laos and Thailand.
3. a western line through Burma.

China's plan for a high-speed rail line from Kunming to Ruili, crossing to Muse in Burma before going via Lashio and Mandalay to Yangon, and continuing further

[59] Yun Sun, (2014, August 14), *op. cit.*

south to Moulmein is a very long-term possibility.[60] Work has already begun on the high-speed line from Kunming to Ruili within China.[61] This line is a part of China's grand vision to link China to other countries in Asia.[62] China may well use it as a bargaining chip in negotiations with Burma over major hydropower projects such as the Myitsone Dam.[63] The current NLD government is unlikely in my opinion to allow Burma to become more dependent on China and Chinese technology by contemplating a high-speed rail link between Kunming and Yangon.

4.4.1 The Proposed China-Vietnam Line

The eastern line through Vietnam is the most advanced of these three lines. A line between Kunming and Yuxi, 89 kilometres south of Kunming, was opened in 1993. In August 2012 a 141-kilometre line from Yuxi to Mengzi on the route to the Vietnamese border was officially completed.[64] The line is a part of the Pan-Asia Railway network that will eventually link China to various ASEAN countries.[65] As with the planned China-Laos railway, over half of this distance of 141 kilometres is on viaducts or in tunnels, reflecting the mountainous terrain through which the line is travelling. There are 35 tunnels and 61 bridges in this new line from Yuxi to

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[60] Khin Su Wai, (2016, December 5), "China eyes high speed railway as part of One Belt, One Road strategy", *op. cit.*

[61] *Ibid*.

[62] *Ibid*.

[63] By early 2017 the role of Myitsone Dam may have shifted, with suggestions China was willing to abandon it in favour of other infrastructure projects such as smaller-scale hydropower dams, and also preferential access to the deep-sea port of Kyaukphyu. By early 2017 China's interest in the Myitsone Dam project had diminished because of an oversupply of electricity and an economic slowdown in China. See:

Lee, Yimou and Shwe Yee Saw Myint, (2017, April 5), "China may scrap divisive dam in Myanmar to advance other interests: sources", Reuters. Retrieved from: http://www.reuters.com/article/us-china-silkroad-myanmar-dam-idUSKBN1771VI.

However, diplomatic channels suggest that China may still be pushing Burma to resume construction of the dam. See:

Lun Min Mang, (2017, April 7), "President U Htin Kyaw may discuss Myitsone dam during China visit", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/national-news/25617-president-u-htin-kyaw-may-discuss-myitsone-dam-during-china-visit.html; and

Clark, Doug Bock and Corey Pattison, (2017, April 18), "China Is Playing Peacemaker in Myanmar, but with an Ulterior Motive", Foreign Policy. Retrieved from: http://foreignpolicy.com/2017/04/18/china-is-playing-peacemaker-in-myanmar-but-with-an-ulterior-motive-myitsone-dam-energy/.

[64] *Railway Gazette*, (2012, August 16), "Yuxi-Mengzi line completed". Retrieved from: http://www.railwaygazette.com/news/single-view/view/yuxi-mengzi-line-completed.html.

[65] *China Daily*, (2012, August 16), *op. cit*.

Mengzi.[66] The new route being built is primarily intended for freight, with a maximum planned speed of 120 km/hr. The 141 kilometres of standard-gauge line built so far are reported to have cost 4.5 billion Yuan (approximately US$706 million).[67] Much of the line is following the route of the old metre-gauge line of the Kunming-Hai Phong Railway. Service on the old line has been suspended since 2002 due to floods and landslides.[68] As an indication of the engineering involved in the construction of these new lines, a key section of the Yuxi-Mengzi line is the Xiushan Tunnel that is ten kilometres long and took six years to construct due to the geological conditions in a seismic-prone area.[69] This line is a good indicator of what lies ahead if the China-Burma line is to be built. Construction of this 141-kilometre line commenced in December 2005, and took nearly seven years to complete.[70] The line is being extended from Mengzi to Hekou on the Vietnamese border, a distance of 140 kilometres. Construction on the Mengzi to Hekou line commenced in December 2008, and was completed in December 2014.[71] The Chinese hope that this line will be part of their much grander plan to have a standard-gauge line to Singapore. The proposed line, part of the Trans-Asian Railway, has the following route: Kunming - Hekou - Hanoi - Ho Chi Minh City - Phnom Penh - Aranyaprathet - Bangkok - Hat Yai - Butterworth - Kuala Lumpur – Singapore.[72] The missing links in the Kunming-Singapore Railway are shown in yellow in Map 10.[73]

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[66] Briginshaw, David, (2012, August 17), "Final rail laid on China's Yuxi-Mengzi line", International Railway Journal. Retrieved from: http://www.railjournal.com/index.php/track/final-rail-laid-in-asian-link.html?channel=542.

[67] *Ibid*.

[68] *The Man in Seat 61* website, *op. cit*.

[69] *ChinaDaily Europe*, (2012, January 11), "China drills major tunnel for ASEAN railway". Retrieved from: http://europe.chinadaily.com.cn/china/2012-01/11/content_14424918.htm.

[70] *Railway Gazette,* (2012, August 16), *op. cit*.; and

Horton, Chris (2011, August 25), "Thai announcement puts rail network future in doubt", *GoKunming* website. Retrieved from: http://www.gokunming.com/en/blog/item/2378/thai_announcement_puts_rail_network_future_in_doubt.

[71] *Railway Gazette*, (2014, December 8), "Standard gauge line reaches Hekou". Retrieved from: http://www.railwaygazette.com/news/single-view/view/standard-gauge-line-reaches-hekou.html.

[72] Buhrmester, Hans-Juergen, (2005, January), "The Narrow Gauge Railways in Yunnan Province of China". Retrieved from: http://2bangkok.com/forum/archive/index.php/t-3047.html?s=524a391380a79863a76e7049b7c80552; and

Wikipedia website, "Kunming-Singapore Railway". Retrieved from: http://en.wikipedia.org/wiki/Kunming%E2%80%93Singapore_Railway.

[73] *Wikipedia* website, "Kunming-Singapore Railway", *op. cit.*

Map 10: The missing links in the Kunming-Singapore Railway.

In late 2010 a 120-kilometre stretch of line was re-opened in Cambodia, linking Phnom Penh to Touk Meas near the Vietnamese border.[74] This line was only used for freight, but the service was suspended in March 2012 because of delays in infrastructure enhancement work.[75]. Upgrading work has also commenced on the so-called Northern Line running from Phnom Penh to Sisophon, which is close to the border with Thailand.[76] These lines form part of one of the missing links in the Kunming-Singapore Railway.

The Pan-Asia Railway is a railway that links countries in Asia, compared to the Trans-Asian Railway that is larger and goes across Asia. In their press releases the Chinese prefer to use the term "Pan-Asia Railway". For example, the

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[74] Ichikawa, Taro, (2010, October 22), "Pan-Asian Railway no Longer a Dream", The Brunei Times. Retrieved from: http://www.bt.com.bn/opinion/2010/10/24/pan-asian-railway-no-longer-dream.

[75] *Railway Gazette*, (2012, October 11), "AusAID pledges funding as Cambodian rehabilitation resumes". Retrieved from: http://www.railwaygazette.com/news/single-view/view/ausaid-pledges-funding-as-cambodian-rehabilitation-resumes.html.

[76] *Ibid*.

map shown in Map 11 is entitled *Blueprint of the Eastern Line of the Pan-Asia Railway Network*.[77]

Map 11: The Chinese view of the eastern line of the Pan-Asia Railway.

This map suggests that possibly one day the Chinese also see Kunming being linked via Mandalay to Yangon. It seems that China hopes not only to build a line to Kyaukphyu, but also to have access to the line to Yangon.[78] However the Chinese may have to make do with the existing metre-gauge line that runs from Mandalay to Yangon. The construction of a standard-gauge line from Yangon to Mandalay is not on the agenda of Myanma Railways at present. The focus of Myanma Railways is to upgrade the existing metre-gauge line, with financial and

[77] *China Daily*, (2012, August 16), *op. cit*.

[78] Fan, Hongwei, (2011), "China's 'Look South': China-Myanmar Transport Corridor", Ritsumeikan International Affairs, Vol.10, pp.43-66. Retrieved from: http://www.ritsumei.ac.jp/acd/re/k-rsc/ras/04_publications/ria_en/10_04.pdf.

technical help from Japan.[79] The upgrading of the line should lead to quicker travel. For example, it is expected that the trip from Yangon to Mandalay will be reduced initially to twelve hours compared to the current fourteen hours.[80]

4.4.2 The Proposed China-Laos Line

A proposed railway line from China to Laos is important in the context of what might happen with the China-Burma line. In April 2012 the Ministry of Planning and Investment in Laos unveiled plans for the construction of a 414-kilometre railway from Vientiane, the capital of Laos, to the Chinese border.[81] The line will continue from Boten on the Chinese side of the border to the town of Xishuangbanna in the southern part of Yunnan Province and then on to Kunming, as shown in Map 12 below.[82]

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[79] *Japan International Cooperation Agency*, (2014, September 5), "Signing of Japanese ODA Loan Agreement with the Republic of the Union of Myanmar". Retrieved from: http://www.jica.go.jp/english/news/press/2014/140905_01.html; and

Bhaskar, Utpal, (2013, June 11), "Japan completes feasibility study of Myanmar rail project", LiveMint. Retrieved from: http://www.livemint.com/Politics/xLyGG4f77gZscTHmIlRnbJ/Japan-completes-feasibility-study-of-Myanmar-rail-project.html.

[80] Soe Win, (2015, November 4), "Yangon-Mandalay express train to take only 12 hours by 2016", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-11-04-red.pdf.

[81] Phouthonesy, Ekaphone, (2010, October 5), "Laos, China to cooperate in railway construction", Vientiane Times. Retrieved from: http://laomate.activeboard.com/t40790724/laoschina-to-cooperate-in-railway-construction; and

Vientiane Times, (2012, April 19), "Planned Laos-China Railway Back On Track". Retrieved from: http://jclao.com/archives/5852; and

Gronholt-Pedersen, Jacob, (2012, October 24), "Laos Says China to Finance Rail Link", Wall Street Journal Online. Retrieved from: http://online.wsj.com/article/SB10001424052970203897404578076193521305574.html.

[82] *Radio Free Asia*, (2012, October 19), "Laos to Go It Alone". Retrieved from: http://www.rfa.org/english/news/laos/train-10192012123940.html; and

Janssen, Peter, (2017, June 24), "Land-locked Laos on track for controversial China rail link", Nikkei Asian Review. Retrieved from: http://asia.nikkei.com/Politics-Economy/International-Relations/Land-locked-Laos-on-track-for-controversial-China-rail-link.

The length of the proposed railway has varied since it was first proposed, but as at June 2017 it is planned to be 414 kilometres in length.

Map 12: The route of the planned China-Laos railway project.

The missing links in the railway network in Southeast Asia are shown in Map 10 above. Map 10 as a well as Map 12 above show the line in Laos from Vientiane to the Laos-China border, with the link to Kunming from the Laos-China border being clearly shown.

Plans for the line in Laos were suspended in 2012 over China's demands to use land (sometimes up to six miles) on either side of the track.[83] Negotiations recommenced in August 2012 with the Laotian Government seeking a negotiated outcome regarding the construction of the railway.[84] Initially China and Laos had agreed to a 70/30 joint venture to build and operate the railway, with China being the senior partner.[85] However, in October 2012 China withdrew from the joint venture, with the Laotian Government announcing it would go ahead by itself.[86] The railway was to be financed by a US$7 billion loan from the Exim Bank of China.[87] China has an equity stake via the 70/30 joint venture, and the intention

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[83] *Le Monde*, (2012, July 15), "China's Big Designs on Small and Strategic Laos". Retrieved from: http://www.worldcrunch.com/chinas-big-designs-small-and-strategic-laos/5865.

[84] *Vientiane Times*, (2012, August 27), "Cabinet discusses progress report on Laos-China rail project". Retrieved from: http://www.vientianetimes.org.la/FreeContent/FreeConten_Cabinet.htm.

[85] Vietstock, (2011, November 14), "Laos-China railway not losing speed". Retrieved from: http://en.vietstock.com.vn/2011/11/laos-china-railway-not-losing-speed-planning-official-977-115255.htm.

[86] *Vientiane Times*, (2012, October 19), "Govt goes full steam ahead with Laos-China rail project". Retrieved from: http://www.vientianetimes.org.la/FreeContent/FreeConten_Govt_goes.htm.

[87] *Ibid*.

was to use about 50,000 labourers to build the line (mostly Chinese), with China supplying the trains, equipment and technology.[88] The Chinese construction company pulled out of the joint venture because it felt it was not profitable enough. The Laotian Government is determined to go ahead, as it sees the railway as crucial for linking Laos (a land-locked country) to the region, attracting more foreign investment and boosting economic growth.[89] The view of the Laotian Parliament was that:[90]

> *it is essential for national development at a time when economic integration is viewed as the future of the region.*

The same words could be used when discussing the proposed China-Burma Railway.

China has surveyed the route; the design phase has been completed; and construction commenced in December 2016.[91] The estimated cost in 2011 was US$7 billion, with a target construction time of five years, with the line scheduled to be completed by 2017.[92] By mid-2017 the cost had been revised down to UDS$6 billion, with a completion date well beyond 2017.[93] At a cost of US$6 billion, this represents nearly half of Laos' Gross Domestic Product that was US$13.7 billion in 2016. The railway will be developed in the form of a BOT Project ("Build, Operate and Transfer"). The World Bank and Asian Development Bank have both questioned the viability of this project, also expressing concern at the high level of debt Laos will take on. These issues are very similar to the questions raised about a Chinese-built standard-gauge railway line recently opened in Kenya. This line in Kenya is discussed in §4.11 at the end of this chapter.

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[88] Janssen, Peter, (2011, May 1), "7-billion-dollar Lao-China railway project runs into delays", Business News. Retrieved from: https://groups.yahoo.com/neo/groups/archive-laonews/conversations/messages/18404.

[89] *Vientiane Times*, (2012, October 19), *op. cit.*

[90] *Ibid*.

[91] *Railway Gazette,* (2016, December 28), "Construction starts on China – Laos railway". Retrieved from: http://www.railwaygazette.com/news/infrastructure/single-view/view/construction-starts-on-china-laos-railway.html; and

Janssen, (2017, June 24), *op. cit.*

[92] Janssen, (2011, May 1), *op. cit.*; and

Gronholt-Pedersen, (2012, October 24), *op. cit.*

[93] Janssen, (2017, June 24), *op. cit.*

China will be able to use the line to import mineral resources, especially potash, from Laos as well as timber and agricultural products. Access to the potash seems to be a key element in China's backing of the new railway. Laos has ten potash mines under development, and they will have the potential to produce five to seven million tons of potash per year. Most of this will be sold to China via the new railway. Potash is a key ingredient in fertilizer production. In return for financing the project, China will secure access to this supply of potash, other mineral resources as well as timber and agricultural products.[94] Five million tonnes of minerals, mainly potash, would be exported to China each year for several years after the line is complete.[95] It is highly likely that similar concessions will be extracted from the Myanmar government before the China-Burma Railway goes ahead.

There have been concerns as to how Laos will service the loan for the new railway.[96] The interest on the 30-year loan will be over US$3.3 billion over the life of the loan. Not surprisingly members of parliament in Laos:[97]

> *have expressed opposition to the project, concerned that Chinese loans could saddle the resource-starved country with financial problems and tighten Beijing's grip on Laos.*

The International Monetary Fund reported in October 2012 that the country's current account deficit had widened and that its gross international reserves had declined. The reserves (about US$677 million at the end of 2011) were only covered by about two months of prospective non-resource imports.[98] This is the lowest in a decade. In 2012 the size of the loan amounted to a staggering 86% of Laos' annual US$8.3 billion GDP, and economists feared that this could be an

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[94] These views were provided by Mr Soulivong Dalavong, the Laotian Minister for Energy and Mining. See: Gronholt-Pedersen, (2012, October 24), *op. cit.*

[95] Campbell, Charlie, (2013, April 15), "Laos' Mammoth Train Project a Fast Track to Debt and Despair", Time Magazine. Retrieved from: http://world.time.com/2013/04/15/laoss-mammoth-train-project-a-fast-track-to-debt-and-despair/.

[96] *Radio Free Asia*, (2012, December 12), "Laos Faces Rail Loan Squeeze". Retrieved from: http://www.rfa.org/english/news/laos/railroad-12022012123010.html.

[97] *Ibid*.

[98] *Radio Free Asia*, (2012, October 19), *op. cit.*; and

International Monetary Fund, (2012, October), "Lao People's Democratic Republic", IMF Country Report No. 12/286. Retrieved from: http://www.imf.org/external/pubs/ft/scr/2012/cr12286.pdf; and

International Monetary Fund, (2012, October 18), "IMF Executive Board Concludes 2012 Article IV Consultation with the Lao People's Democratic Republic." Retrieved from: http://www.imf.org/external/np/sec/pn/2012/pn12121.htm.

"insurmountable deficit".[99] As indicated above, this figure is now about 50% of GDP. Jonah Blank, a senior political scientist at Rand Corporation, summed up the situation in Laos with the following words:[100]

> *No Chinese investment deal comes without strings.*

This suggests that China will have a strong influence on Laos' foreign policy. It is possible that the China-Burma Railway could run into similar problems, even in spite of the massive amounts of revenue from the sale of natural gas.

The plans announced for the China-Laos Railway in October 2012 for the railway give some insight into what may happen with the China-Burma Railway.[101] The line in Laos will be standard gauge. Along the line, a 50-metre wide section of land will be cleared on either side of the railway, and will be fenced off for security reasons. At tunnels, the width of land cleared on either side will be 100 metres. At major railway stations, parcels of land 3 kilometres by 250 metres will be allocated for development. Not all the stations will be built initially: 31 are planned but only 20 will be built in the initial stage of construction.[102] The mountainous terrain through which the line will travel has caused the change of tack by the Chinese, citing lack of profitability. The same could happen with the China-Burma Railway. At the operational level, the Laotian Government has announced that passenger trains will only travel at 160 km/hr, not the 200 km/hr initially planned, due to the terrain. Goods trains will travel at a maximum of 120 km/hr. A very interesting statistic is that of the 414-kilometre length of the line (from Vientiane to Boten on the Chinese border), there will be 190 kilometres of tunnels (nearly 50% of the length) and 90 kilometres of bridges (20% of the length).[103] The terrain in northern Laos is more mountainous than where the line will be built in Burma, but nevertheless there could be a high degree of tunnelling, viaducts and bridge building to take a railway line from Muse on the Burma/China border to Mandalay. A photograph of the terrain in central Laos is shown in Plate 40, highlighting how mountainous it is. I travelled through this region in 2007.

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[99] Campbell, (2013, April 15), *op. cit.*

[100] *Ibid*.

[101] The plans were announced at an extraordinary session of the National Assembly in Laos, indicating the level of importance the Laotian Government is placing on the new railway.

[102] Campbell, (2013, April 15), *op. cit.*

[103] *LaoOnline*, (2011, January 20), "Promotional video of Laos-China railway". Retrieved from: http://asiapacific.anu.edu.au/newmandala/2011/01/20/promotional-video-of-laos-china-railway/.

Plate 40: High mountains in Laos, between Vang Vieng and Luang Prabang.

The controversy the line has caused in Laos is probably a good indicator of what lies ahead for Burma. The farmers in Laos are particularly concerned:[104]

> *Area farmers already understand what would await them once construction starts. "The railway line will cross straight through my village, then that road over there before entering a tunnel built into the mountain,", says 'Uncle' Kampan. . . . . "And since it will run through our village, we will have to move out."*

In Burma, there is already concern among the rural community about the oil and gas pipelines that have been constructed through Burma from China. The same will happen if construction of the railway line in Burma commences. In Laos, "the heightened Chinese presence brings with it a certain amount of mistrust not to say out-and-out hostility".[105] Similar feelings towards the Chinese will increase in Burma if construction of the China-Burma Railway ever commences. There is

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[104] *Le Monde*, (2012, July 15), *op. cit*.

[105] *Ibid*.

For example, in the initial construction in Laos, Janssen reports workers' dormitories where all the workers are Chinese, and markets are being set up to cater for Chinese work crews. I saw a similar situation in Hsipaw in Shan State in January 2012 where a camp was set up (on the road to Namtu) to house Chinese workers working on the oil and gas pipeline construction. There was resentment in Hsipaw towards this camp. See:

Janssen, (2017, June 24), *op. cit*.

already an anti-Chinese sentiment in Burma, dating back to the anti-Chinese riots in 1967 and before that as well.[106]

4.4.3 Proposed Construction of Railway Lines in Thailand by China and Japan

The southern line through Laos is a part of the so-called Kunming-Singapore Railway whose route is Kunming - Vientiane - Nong Khai - Bangkok - Kuala Lumpur – Singapore.[107] The portion of the line from Vientiane to Bangkok is in doubt following a policy shift in 2011 by the then Thai Prime Minister, Ms Yingluck Shinawatra. This shift in policy gave priority to three domestic high-speed lines starting from Bangkok:[108]

- a 700-kilometre line to Chiang Mai in northern Thailand.
- a 200-kilometre line to Hua Hin in south-west Thailand.
- a 260-kilometre line to Nakhon Ratchasima in the north-east.

In 2011 a high-speed line between Bangkok and Nong Khai, a town on the Thailand/Laos border, was postponed. A statement from the Thailand Transport Ministry Permanent Secretary, Mr Supoj Sablorm, said that the postponement was due to the completion date of the Laos-China railway being pushed back.[109] The Chinese were hoping to connect to a high-speed railway in Thailand that would go all the way to Singapore.[110]

In March 2013 there was a reversal of this policy, with the Thai cabinet approving a US$68 billion infrastructure investment bill, with the bulk of this going into rail.[111] Thailand plans to double its route of 3,000 kilometres of metre-gauge lines as well as building four high-speed standard-gauge lines. These will radiate from Bangkok and have trains travelling at 250 km/hr. They will be built in two stages, initially reaching Hua Hin, Nakon Ratchasmina and Pattaya. They would

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[106] Steinberg, David I. and Hongwei Fan, (2012), "Modern China-Myanmar Relations. Dilemmas of Mutual Dependence", Nordic Institute of Asian Studies, NIAS Press, Denmark, pp.93-118.

[107] Gluckman, Ron, (2014, October 27), "Thailand Approves Kunming-Singapore Rail Line", Forbes. Retrieved from: http://www.forbes.com/sites/forbesasia/2014/10/27/thailand-approves-kunming-singapore-rail-line/.

[108] Horton, (2011, August 25), *op. cit.*

[109] *Ibid*.

[110] *Vientiane Times*, (2012, April 19), *op. cit*.

[111] *Railway Gazette*, (2013, March 13), "Rail at heart of US$68bn investment programme". Retrieved from: http://www.railwaygazette.com/news/single-view/view/rail-at-heart-of-us68bn-investment-programme.html.

then be extended to Chiang Mai in the north, the port of Rayong in the south-east of the country, with the others extending to the borders with Malaysia and Laos. The latter two lines are a part of the proposed Pan-Asia Railway that is being backed by China. These are clearly ambitious long-term plans, with the hope of tripling the number of train movements in Thailand and switching freight transport from road to rail. It is hoped that 500,000 jobs will be created.

In May 2014, a military coup led by General Prayuth Chan-ocha ousted the government of Ms Yingluck Shinawatra.[112] In July 2014 the interim military government announced a change of direction for the State Railway of Thailand.[113] This government is giving priority to the double tracking of 734 *km* of existing metre track, rather than the construction of the four standard-gauge lines. There are also plans to encourage private operators as the rail sector is restructured in Thailand. Interestingly, the interim government is also assessing the viability of converting the country's 4,000 *km* of metre gauge to standard gauge (1,435 *mm*).[114] This would be a mammoth task, but if it were to go ahead it could influence Burma to do the same.

In December 2014 the National Legislative Assembly in Thailand approved a Memorandum of Understanding between the governments of Thailand and China for the construction of the line from Nong Khai to link with the proposed line through Laos.[115] The line proposed in Thailand is a standard-gauge double-track line

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[112] *BBC News*, (2014, May 22), "Thailand military seizes power in coup". Retrieved from: http://www.bbc.com/news/world-asia-27517591.

[113] *Railway Gazette*, (2014, July 24), "Private operators to be encouraged under railway reform plans". Retrieved from: http://www.railwaygazette.com/news/news/asia/single-view/view/private-operators-to-be-encouraged-under-railway-reform-plans.html.

[114] It is feasible that gauge conversion could occur in Thailand, but it will not be cheap. In Australia 1,000 kilometres of Irish broad gauge (1,600 *mm*) track is being upgraded and converted to standard gauge. This is in the Murray Basin in Victoria. The cost is A$440 million or A$440,000 (US$330,000) per kilometre. See:

Railway Gazette, (2017, June 27), "Murray Basin gauge conversion contract awarded". Retrieved from: http://www.railwaygazette.com/news/infrastructure/single-view/view/murray-basin-gauge-conversion-contract-awarded.html; and

Victoria State Government, (2017), "Murray Basin Rail Project". Retrieved from: https://static.ptv.vic.gov.au/siteassets/PTV/PTV%20docs/Projects/Murray-Basin-Rail-Project-Summary-Brochure.pdf.

[115] *Railway Gazette*, (2014, December 4), "Chinese-backed standard gauge project edges forward). Retrieved from: http://www.railwaygazette.com/news/news/asia/single-view/view/chinese-backed-standard-gauge-project-edges-forward.html. The Memorandum of Understanding was signed on 19th December 2014. See:

Jikkham, Patsara and Chatrudee Theparat, (2014, December 20), "Prayut, Li strike railway accord", Bangkok Post. Retrieved from: http://www.bangkokpost.com/business/news/450950/prayut-li-strike-railway-accord.

734 *km* long, from Nong Khai (on the Thai-Lao border) to the deep-sea port of Map Ta Phut near Rayong in the south of Thailand. There would also be a 133 *km* spur line linking Kaeng Khoi with Bangkok. By using standard gauge rather than metre gauge, it is hoped that the trains will be able to travel faster at 160-180 km/hr compared to an average of 50 km/hr on the current metre-gauge network.[116] The project is estimated to cost US$10.6 billion, and will enable China to use Chinese standards, equipment and manufacturing capacity in the construction.[117] It is hoped that construction will be completed by 2022. In many ways, this could be a model for a future China-Burma railway: built by the Chinese using their technology and equipment; cost probably US$20-30 billion or more; initially a double-track standard-gauge line suited to trains travelling much quicker than now, but not to the high-speed rail standard.

The operating model for the two standard-gauge lines to be built in Thailand by China provides some hint at what sort of operating model will be in place if ever the China-Burma Railway goes ahead. The key points of the Sino-Thai agreement signed in March 2015 were:[118]

- China will construct the tunnels; supply and install track and signalling equipment; and also supply the rolling stock.
- Thailand will be responsible for civil work such as land expropriation and track foundation, as well as supplying power.
- China will run the line unilaterally for the first three years of operation. Then it would be a joint venture made up as follows: China (30%); State Railway of Thailand (30%); Thai investors (30%); and Chinese agencies (10%).

The railway lines that China proposes to build in Thailand are shown in Map 13 below.[119]

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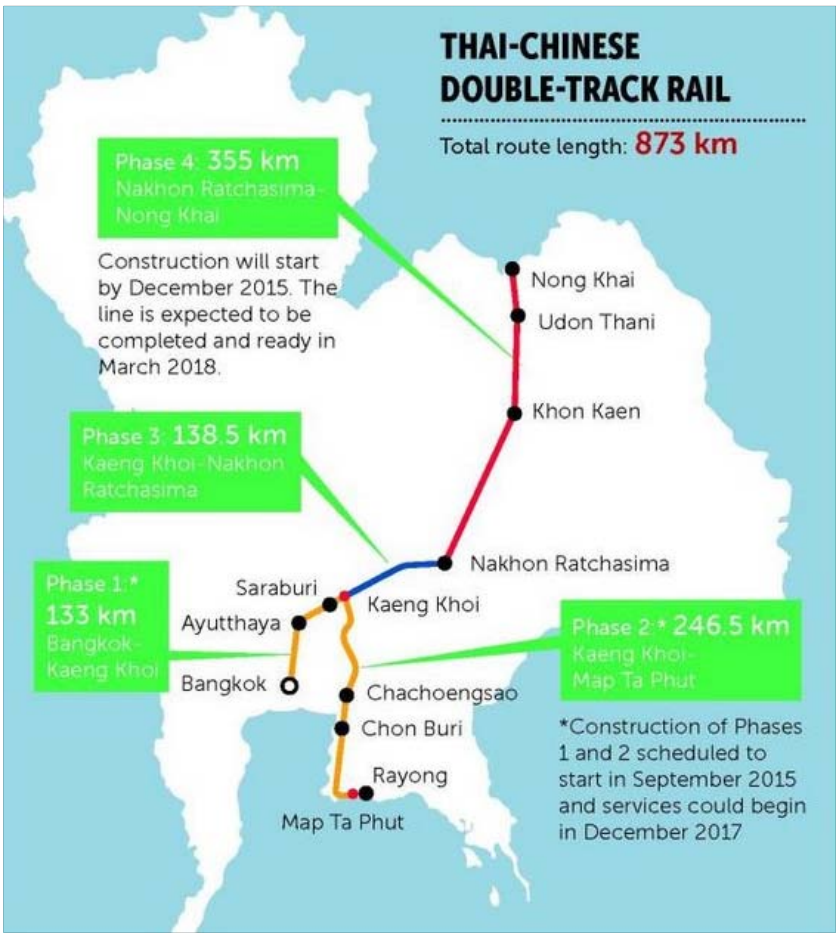
[116] Sattaburuth, Aekarach, (2014, December 4), "NLA OK's Thai-China railway deal", Bangkok Post. Retrieved from: http://www.bangkokpost.com/news/transport/447200/nla-oks-thai-china-railway-deal.

[117] *The Global New Light of Myanmar*, (2014, December 21), "China, Thailand eye closer agriculture, railway cooperation". Retrieved from: http://www.burmalibrary.org/docs20/GNLM2014-12-21-red.pdf.

[118] *Railway Gazette*, (2015, March 13), "Sino-Thai operating agreement". Retrieved from: http://www.railwaygazette.com/news/news/asia/single-view/view/sino-thai-railway-operating-agreement.html; and

Bangkok Post, (2015, March 12), "Sino-Thai railway agreement signed". Retrieved from: http://www.bangkokpost.com/news/general/495513/sino-thai-railway-agreement-signed.

[119] Fernquest, Jon, (2015, January 16), "Thai-China railway to start this year", Bangkok Post. Retrieved from: http://www.bangkokpost.com/learning/learning-news/457230/thai-china-railway-to-start-this-year; and



Map 13: The railway lines that China proposes to build in Thailand.

By June 2017 the Thai government was expressing its concern at the slowness of construction of this line. The Thai government was planning to use the absolute powers in Article 44 of the Thai interim constitution to sort out legal problems that were delaying the construction of the initial high-speed train project from Bangkok to Nakhon Ratchasima, which is 252 kilometres in length.[120] Construction on this line is now scheduled to start in September 2017.[121]

Shortly after the announcement in December 2014 of the Memorandum of Understanding with China, the Thai government announced it was in discussions with Japan to build three other lines:

Bangkok Post, (2016, March 24), "Thailand to go it alone on Thai-Sino high-speed rail". Retrieved from: http://www.bangkokpost.com/news/general/908328/thailand-to-go-it-alone-on-thai-sino-high-speed-rail.

[120] *Xinhua News Agency*, (2017, June 13), "Thai PM to speed up Thailand-China railway project". Retrieved from: http://news.xinhuanet.com/english/2017-06/13/c_136362694.htm.

[121] Ono, Yukaro, (2017, June 23), "Thai junta beseeches foreign investors: 'Please come now' ", Nikkei Asian Review. Retrieved from: http://asia.nikkei.com/Politics-Economy/Economy/Thai-junta-beseeches-foreign-investors-Please-come-now.

1. From Mae Sot near the border with Burma to Mukdahan near the border with Laos.[122]
2. A line connecting Kanchanaburi with the industrialised province of Rayong (the same destination as the line China plans to build from Nong Khai as discussed above).[123]
3. A line from Bangkok to Chiang Mai in the north.

These three lines have a total length of 1,500 kilometres.[124] Only the line to Chiang Mai is the same as was proposed in 2011 by the former Prime Minister Yingluck Shinawatra. A fourth line was added to this list in January 2015. This is a standard-gauge line from Dawei to Kanchanaburi in Thailand and across Thailand to Cambodia.[125] What is emerging is that it is China and Japan who will be involved in railway construction and improvement in both Thailand and Burma. This is a growing trend, with China and Japan being involved in infrastructure projects in Southeast Asia. Indeed, the Thai Prime Minister Prayuth Chan-ocha in June 2017 urged Western countries to invest in Thailand, saying:[126]

> *We want to see more investment from Western countries, …. if you don't come soon, all the projects will be taken up by the Chinese and the Japanese.*

In many respects, this is what could happen in Burma.

4.5 The Question of Gauge

If the China-Burma line from Kunming to Kyaukphyu is ever built, it will be standard gauge to match the railway gauge in China. Given the run-down condition of the existing metre-gauge system in Burma, it is highly unlikely that the Chinese would agree to have a break of gauge at the border with a metre-gauge line to be constructed to Kyaukphyu. Likewise, it is unlikely that a dual-gauge line would be constructed from the China-Burma border to Kyaukphyu. A dual-gauge line has a

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[122] If a line in Thailand is ever built to Mae Sot, which is across the border from Myawaddy in Burma, it is not impossible the line could extended into Burma to go from Myawaddy to Moulmein, to link with the Myanma Railways network. The terrain in Burma between Myawaddy and Moulmein is rather hilly.

[123] Fernquest, (2015, January 28), *op. cit.*

[124] Temphairojana, Pairat, (2014, December 20), "Thailand looking to Japan for railways revamp", Reuters. Retrieved from: http://www.reuters.com/article/2014/12/20/thailand-japan-railway-idUSL3N0U403920141220.

[125] Fernquest, (2015, January 28), *op. cit.*

This line will be discussed briefly in Chapter 8.

[126] *Ibid*.

track that allows trains of different gauge to use the same track. In response to a question in the Amyotha Hluttaw in January 2015, the Deputy Minister for Rail Transportation, U Myint Thein, said that Burma was now producing dual-gauge sleepers compatible with both metre-gauge and standard-gauge systems.[127] I interpret this to mean that the sleepers could be used for either metre gauge or standard gauge, but not to have the two on the same track. This suggests that the government in Nay Pyi Taw is prepared to accept standard-gauge lines being built within Burma.

The two major lines planned to run south from Kunming (the China-Laos line and the China-Vietnam line) are a different issue. The line to Hekou on the China-Vietnamese border is standard gauge, and I would not be surprised to see it extended to Hanoi in the form of a standard-gauge line or a dual-gauge line.[128] At Hanoi, a break of gauge is likely as there is already a well-established metre-gauge line to Ho Chi Minh City in the south, and the line to Singapore from Bangkok is also metre gauge. A metre-gauge line would need to be built linking Ho Chi Minh City to Phnom Penh in Cambodia. The line between Phnom Penh and Poipet on the Thai border was being rehabilitated under an Australian Agency for International Development (AusAID) program.[129] Poipet is on the Thai/Cambodian border, across the border from Aranyaprathet which is the railhead of the line from Bangkok. The line in Cambodia that was being rehabilitated is shown in Map 14.[130]

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[127] *The Global New Light of Myanmar*, (2015, January 28), *op. cit*.

The Amyotha Hluttaw is the Upper House of the Union of Myanmar Parliament.

[128] In Vietnam standard-gauge lines and dual-gauge lines are already in use north-east of Hanoi, for example on the Hanoi-Dong Dang line and the Hanoi-Thai Nguyen line. See Map 15 ("Vietnam Railways Northern Rail Network") in:

Doling, (2012), *op. cit.*, p.382.

A metre-gauge line runs north-west from Hanoi to Lao Cai near the border with China. North-east of Hanoi there are dual-gauge lines (1 metre and 1.435 metre (standard gauge)), as well as a standard-gauge line running to the coastal town of Ha Long City.

[129] Santos, Lean Alfred, (2014, February 7), "ADB admits mistakes over controversial project in Cambodia", Devex. Retrieved from: https://www.devex.com/news/adb-admits-mistakes-over-controversial-railway-project-in-cambodia-82809.

[130] *Toll Group*, (2010, October), "Toll Royal Railway – media kit. Launching the Cambodian Railway", *Toll Group* website. Retrieved from: http://www.tollgroup.com/media/2010/MediaKit_TGL_Cambodia_22Oct2010.pdf.

Map 14: Rehabilitation plans for the railway in Cambodia.

This project, which was being conducted by AusAID in conjunction with the Australian transport company Toll Holdings Limited, is currently suspended because of issues over resettlement of people along the route.[131] The Toll Group divested its 55% stake in the project in late 2014, citing poor returns, setbacks and delays.[132]

The China-Laos Railway will be standard gauge to Vientiane, the capital of Laos. From there I would expect a change of gauge to metre gauge, linking into the metre-gauge line to Nong Khai, Bangkok and south to Singapore. Comparing the China-Burma line to the China-Vietnam-Singapore line and the China-Laos-Singapore line, the latter two are heading into countries with well-established metre-gauge lines (Vietnam, Thailand, Malaysia and Singapore). The Chinese will probably be forced to accept a break of gauge at Hanoi and Vientiane. By contrast, the existing metre-gauge lines in Burma are in poor condition (and this includes

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[131] *AID/WATCH*, (2012, March 25), "Suspension of Cambodian Railway Project welcomed by Aid/Watch: Carr must visit resettlement sites for himself." Retrieved from: http://www.aidwatch.org.au/news/media-release-suspension-of-cambodian-railway-project-welcomed-by-aidwatch-carr-must-visit-rese; and

AID/WATCH website, "OFF THE RAILS: AusAID and the troubled Cambodian Railways Project". Retrieved from: http://www.aidwatch.org.au/wp-content/uploads/2013/11/CambodiaReport-WEB.pdf; and

Santos, (2014, February 7), *op. cit.*

[132] *Toll Group*, (2014, December 22), "Toll divests its stake in Cambodia railway", *Toll Group* website. Retrieved from: http://www.tollgroup.com/media-release/toll-divests-its-stake-in-cambodias-railway.

the Yangon-Mandalay line). As a result, a break of gauge at the China-Burma border is highly unlikely.

4.6 The Oil and Gas Pipelines

Four major gas fields have been discovered in the Bay of Bengal off the coast of Burma. All four of these are now in production (Yadana, Yetagun, Shwe and Zawtika).[133] This has seen Burma emerge as a major supplier of gas to neighbouring Thailand, and also as an emerging supplier of gas to China. In order to supply China with gas, a gas pipeline has been built from Kyaukphyu on the Arakan Coast of Burma to Kunming in south-west China.[134] An oil pipeline has been built parallel to the gas pipeline and both are in operation. The gas pipeline was opened in 2013 and carried 1.9 billion cubic metres of gas in its first year of operation.[135] A deep-sea port on Ramree Island off the Arakan Coast at Kyaukphyu has been constructed, and was officially opened in January 2015, with the oil pipeline to China reported as being completed at the same time.[136] Pre-commissioning of the pipeline commenced in late January 2015.[137] The port has twelve storage tanks with a storage capacity of 22 million gallons of oil, and will be used by the Chinese to import crude oil from the Middle East and Africa, with the

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[133] Boot, William, (2014, August 7), "More Burmese Gas Pumped Over the Border as Thai Reserves Dwindle", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/business/burmese-gas-pumped-border-thai-reserves-dwindle.html; and

Boot, William, (2014, March 22), "'Complications' in Shwe Field Slow Burma's Gas Flow to China", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/business/irrawaddy-business-roundup-march-22-2014.html.

[134] *Shwe Gas Movement*, (2009, September), "Corridor of Power: China's Trans-Burma Oil and Gas Pipelines". Retrieved from: http://www.shwe.org/wp-content/uploads/2011/03/CorridorofPower.pdf; and

Ba Kaung, (2011, October 6), "Pipelines to China Become New Target For Burmese Activists", The Irrawaddy. Retrieved from: http://www2.irrawaddy.org/article.php?art_id=22207.

[135] Rose, Adam and Aung Hla Tun, (2015, January 20), "Oil pipeline through Myanmar to China expected to open in Jan – sources", Reuters. Retrieved from: http://www.reuters.com/article/2015/01/20/petrochina-myanmar-oil-idUSL3N0U22PP20150120.

[136] Khin Oo Thar, (2011, March 1), "Maday Island Deep-Sea Port no Boon to Locals", The Irrawaddy. Retrieved from: http://www2.irrawaddy.org/article.php?art_id=20851; and

The Global New Light of Myanmar, (2015, January 31), "Ma-de Island Crude Oil Unloading Terminal and SEA crude oil pipeline commissioned into service". Retrieved from: http://www.burmalibrary.org/docs20/GNLM2015-01-31-red.pdf; and

The Irrawaddy, (2015, February 2), "Burma Opens Deep Sea Port for Chinese Oil Pipeline". Retrieved from: http://www.irrawaddy.org/business/burma-opens-deep-sea-port-chinese-oil-pipeline.html.

[137] *The Global New Light of Myanmar*, (2015, January 31), *op. cit*.

oil then being pumped to a refinery in Yunnan Province.[138] In April 2017, Burma and China agreed on the operating terms of the new oil pipeline, after almost a decade of talks. The pipeline will allow oil to be pumped from the Bay of Bengal to supply the new 260,000-barrels-per-day refinery in Yunnan Province.[139] Within days of the signing of the agreement, a trial pumping of oil through the pipeline to China was being prepared, with 130,000 tonnes of crude oil arriving in Kyaukphyu by tanker from the Middle East.[140] The first oil pumped through this line reached China on 19th May 2017.[141] This has been a massive project for the government of Burma who will invest US$1.20 billion, with a further US$2.45 billion coming from foreign investors.[142] The pipeline is 770 kilometres long and has a 32-inch diameter, and can transport up to 22 million tonnes of crude oil per annum.[143] The gas pipeline can pump 12 billion cubic metres per year from the Shwe Gas Field to China.[144] The route of the oil and gas pipelines is shown in Map 15.[145]

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[138] *The Irrawaddy*, (2015, February 2), *op. cit*.

[139] *The Global New Light of Myanmar,* (2017, April 11), "Myanmar, China agree to oil pipeline". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-04-11-red.pdf; and

Aung Shin, (2017, April 3), "Myanmar-China crude oil pipeline to commence next month", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/business/25558-myanmar-china-crude-oil-pipeline-to-commence-next-month.html; and

Aung Shin, (2017, April 11), "Myanmar and China sign crude oil pipeline agreement", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/national-news/25676-myanmar-and-china-sign-crude-oil-pipeline-agreement.html.

[140] *The Global New Light of Myanmar,* (2017, April 13), "Trial pumping of imported crude oil to China via South East Asia pipeline". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-04-13-red.pdf.

[141] *The Global New Light of Myanmar*, (2017, May 21), "First crude enters China through Myanmar-to-China pipeline". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-05-21-red.pdf.

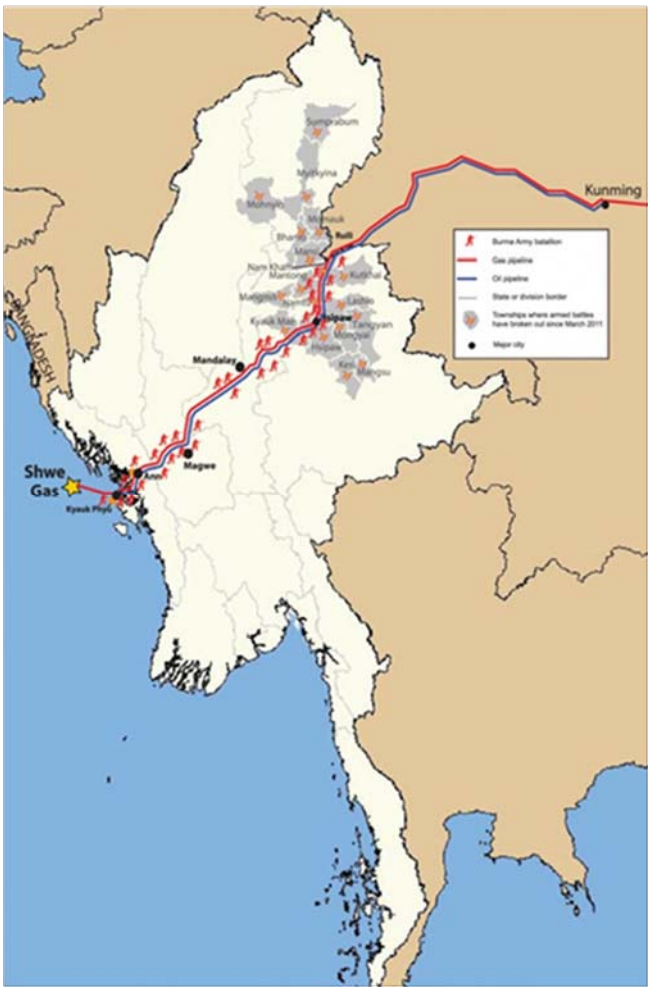
[142] *The Global New Light of Myanmar,* (2015, January 31), *op. cit*.

[143] *The Global New Light of Myanmar*, (2017, April 13), *op. cit*.

[144] Boot, William, (2012, October 27), "Chinese Fuel Pipelines Have Big Transhipment Capacities", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/business/economy/burma-business-roundup-saturday-oct-27.html.

[145] *Shwe Gas Movement* website, *op. cit.*

The map is sourced from: http://www.shwe.org/maps/battleground-from-shwe-gas-project-map/.



Map 15: The route of the oil and gas pipelines to China.

During construction, the pipeline was laid on the surface of the ground as can be seen in Plate 41.

Plate 41: Construction in 2012 of the gas pipeline running parallel to the Mandalay road, near Hsipaw.

The final pipeline is buried, as can be seen in Plate 42, which shows the pipeline near Hsipaw.

Plate 42: Pipeline under construction at Hsipaw in Shan State.

The pipelines are mostly running through prime agricultural land, as can be seen in Plates 41 and 42 above, and Plate 43 below. Construction of a railway parallel to the pipelines will inflict more damage on the rural community.

Plate 43: A pipeline running through prime agricultural land near Hsipaw.

The pipelines have been built by a joint venture between China National Petroleum Corporation (CNPC) and the government-owned Myanma Oil and Gas Enterprise

(MOGE).[146] The oil and gas pipeline workers were Chinese, employed by CNPC Chuangqing Drilling Engineering Company Limited (CCDC), a subsidiary of China National Petroleum Corporation.[147]

A high-speed railway line for goods trains may one day run parallel to the pipelines from south-west China to Kyaukphyu on the Arakan Coast. Construction of the railway was due to start in December 2011, but was postponed.[148] A plant for manufacturing concrete sleepers has been built on the Mandalay road south of Hsipaw, possibly in anticipation of the eventual construction of the China-Burma Railway, but also to supply concrete sleepers for an upgrade of the Mandalay-Lashio line. Whether the proposed railway, if it is ever built, will follow the pipeline is a matter for future planners.

4.7 Potential Land Rights Abuse

Land rights abuse has been an issue with the construction of the oil and gas pipelines, and will probably be an issue as well if a railway from China to Burma is ever constructed. Allegations about land rights abuse related to the construction of the pipelines were made by the Dutch NGO BankTrack:[149]

> *Land has been confiscated by the Burmese military for the [pipelines] projects. Some of these farmers have been forced to sign documents handing over their land to the project and have been given no compensation.*

Human rights groups such as the *Network for Human Rights Documentation - Burma* documented alleged land rights abuse.[150] Areas of alleged land

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[146] Boot, William, (2012, September 15), "Chinese Oil Firm 'Ignores Land Rights' with Burma Pipelines", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/business/burma-business-roundup-saturday-sept-15.html.

[147] *CNPC* website, http://www.cnpc.com.cn/en/.

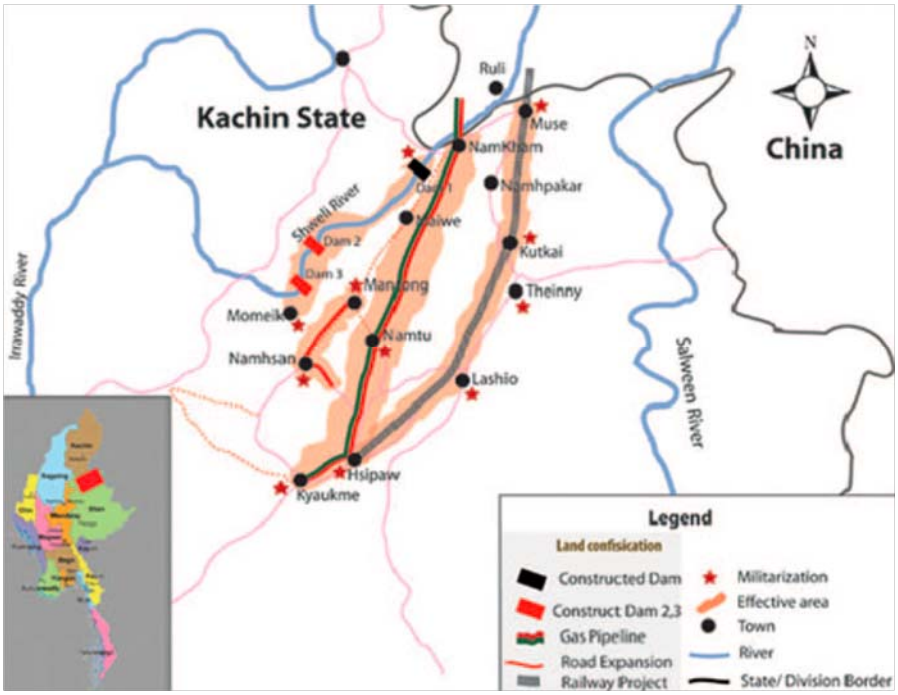
[148] When I was in northern Shan State in early January 2012 I saw no sign of any railway construction relating to the China-Burma Railway. I was able to travel as far as Lashio, but I was not permitted to go to Muse on the Chinese border. The only railway-related construction I saw was abandoned construction for the Hsipaw-Namsang line. See:

Stubbs, (2012, November 26), *op. cit.*

[149] Boot, (2012, September 15), *op. cit.*

[150] *Network for Human Rights Documentation* – Burma, (2011, November 22), "63% of Families Lose Land and Livelihoods to Destructive Development and Land Grabs in the Ta'ang area." Retrieved from: http://www.palaungland.org/eng/statements/1500-63-of-families-lose-land-and-livelihoods-to-destructive-development-and-land-grabs-in-the-taang-area.html.

confiscation for the pipelines, hydropower dams on the Shweli River and the China-Burma Railway are shown in Map 16.[151]



Map 16: Alleged areas of land confiscation in the Ta'ang Region in Shan State.

Interestingly this map shows the new railway following the old Burma Road from Lashio, going via Kutkai to Muse on the border, whereas the gas pipeline has a different route, heading north from Hsipaw via Namtu to Namhkam on the border. The Ta'ang Students and Youth Organization released a report in November 2012 detailing human rights issues associated with the construction of the oil and gas pipelines.[152] The report entitled "*Pipeline Nightmare*" details the confiscation of land, forced labour and an increased military presence that has affected thousands of people. Similar abuse is likely if the China-Burma Railway goes ahead.

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[151] *Ta'ang Student and Youth Organization*, (2011, November), "Grabbing Land. Destructive Development in the Ta'ang Region". Retrieved from: http://burmacampaign.org.uk/reports/grabbing-land-destructive-development-in-the-taang-region/.

The areas of alleged land confiscation are the shaded areas on the map. This map, although hard to read, is useful as it shows the route of the China-Burma Railway diverging from the pipeline route between Hsipaw and the Chinese border. The article alleges there has been land confiscation relating to hydropower dam construction, pipeline construction and the proposed China-Burma Railway.

[152] *Ta'ang Students and Youth Organization*, (2012, November), "Pipeline Nightmare". Retrieved from: http://burmacampaign.org.uk/media/Pipeline_Nightmare.pdf; and

Campbell, Charlie, (2012, November 7), "Govt Accused of Ongoing Abuses at Shwe Pipeline", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/?slide=govt-accused-of-ongoing-abuses-at-shwe-pipeline.

4.8 Political Unrest with Ethnic Groups on the China/Burma Border

An issue that will have an impact on any future construction of a China-Burma Railway is ethnic unrest in north-eastern Shan State.[153] In February 2015 a group, the so-called Myanmar National Democratic Alliance Army (MNDAA) headed by an 85-year-old warlord and drug baron Mr Pheung Kya Shin, launched attacks on the Tatmadaw around Laukkai which is the capital of Kokang, a region near the Burma-China border.[154] This was similar to an incident with the same group in 2009 known as the "Kokang Incident". On this occasion, the Tatmadaw replied by launching airstrikes on the Kokang rebel group. Thousands of local residents fled across the border to Yunnan Province as well as to Lashio.[155] The situation worsened so much that the government declared martial law in the Kokang region.[156] The ethnic unrest in the Kokang area is different in nature to the ethnic unrest in other areas of Burma (e.g. in Kachin State), due to the linkage of the Myanmar National Democratic Alliance Army to China, and past support by China of this group. Yun Sun, a research fellow at the Stimson Center in the US, has summed up the situation as follows:[157]

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[153] Sai Kham Mong, (2005), "Kokang and Kachin in the Shan State (1945-1960), Institute of Asian Studies, Chulalongkorn University, Bangkok, pp.1-3.

[154] *The Economist*, (2015, February 21), "China's changing attitudes towards Myanmar's border groups. Phone home." Retrieved from: http://www.economist.com/news/asia/21644227-chinas-changing-attitudes-towards-myanmars-border-groups-phone-home; and

Dinmore, Guy, (2015, March 2), "Kokang: For Myanmar and China, this time it's different", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/national-news/13297-kokang-for-myanmar-and-china-this-time-it-s-different.html.

[155] Saw Yan Naing, (2015, February 11), "Thousands Reportedly Cross Into China to Flee Fighting, Airstrikes in Shan State", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/burma/thousands-reportedly-cross-china-flee-fighting-airstrikes-shan-state.html; and

Saw Yan Naing, (2015, February 13), "47 Govt Troops Killed, Tens of Thousands Flee Heavy Fighting in Shan State", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/burma/47-govt-troops-killed-tens-thousands-flee-heavy-fighting-shan-state.html; and

Kyaw Myo Tun, (2015, February 16), "Thousands Displaced by Kokang Fighting Arrive in Lashio", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/multimedia-burma/thousands-displaced-kokang-fighting-arrive-lashio.html; and

Stout, David, (2015, February 18), "Thousands of Refugees Are Pouring Into China to Escape Fighting in Burma", Time. Retrieved from: http://time.com/3712912/burma-china-kokang-peace-process/#3712912/burma-china-kokang-peace-process/; and

Lawi Weng, (2015, February 25), "Fighting Spreads Through Northern Shan State, Displacing Hundreds of Civilians", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/burma/fighting-spreads-northern-shan-state-displacing-hundreds-civilians.html.

[156] Soe Zeya Tun, (2015, February 18), "Myanmar declares martial law in troubled Kokang region", Reuters UK. Retrieved from: http://uk.reuters.com/article/2015/02/18/uk-myanmar-clashes-martial-law-idUKKBN0LL1EJ20150218.

[157] Yun Sun, (2015, February 18), "The Kokang Conflict: How Will China Respond?", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/contributor/kokang-conflict-will-china-respond.html.

For China, the strategic importance of Burma significantly outweighs China's interest in the border ethnic groups.

It is unlikely that China will support this group, given China's strategic and economic interests in the oil and gas pipelines, and the potential railway connection. Clashes between this ethnic group, who are mainly Han Chinese, and the Tatmadaw are clearly not conducive to the construction of a major project such as the China-Burma Railway. The government in Nay Pyi Taw will need to come to a peace agreement with this group if the railway is to go ahead.

Tension between Burma and China increased following an incident in March 2015 when a Myanmar plane dropped a bomb on the Chinese side of the border in Yunnan Province, killing four Chinese citizens and injuring nine others.[158] China retaliated by conducting a live-fire exercise in June 2015 in Yunnan near the border between the two countries.[159] The unrest is continuing in 2017. In March 2017 thirty people were killed in a clash between the Tatmadaw and MNDAA rebels.[160] The violence was the worst to hit the Kokang region since 2015. Thousands of Han Chinese from Burma's Kokang region fled across the border to China to live in refugee camps.[161] This has once again raised tensions between the

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[158] Hutzler, (2015, March 15), "China Deploys Forces to Myanmar Border After Bombing", The Wall Street Journal. Retrieved from: http://www.wsj.com/articles/china-rebukes-myanmar-over-bombing-at-border-1426446996.

[159] *ABC News*, (2015, June 1), "China to conduct live-fire drills near Myanmar border as ethnic insurgency rages". Retrieved from: http://www.abc.net.au/news/2015-06-01/china-to-conduct-live-fire-drills-near-myanmar-border/6512384; and

The Irrawaddy, (2015, June 6), " 'China is Fundamentally Very Sensitive About its Sovereignty' ". Retrieved from: http://www.irrawaddy.org/interview/dateline-irrawaddy/china-is-fundamentally-very-sensitive-about-its-sovereignty.html.

[160] *BBC News,* (2017, March 7), "Myanmar rebel clashes in Kokang leave 30 dead". Retrieved from: http://www.bbc.com/news/world-asia-39182713; and

The Global New Light of Myanmar, (2017, March 7), "Civilians, police killed in Laukkai attack by MNDAA". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-03-07-red.pdf; and

National Reconciliation and Peace Centre, (2017, March 7), "Announcement regarding attacks in Laukkai, Shan State", The Global New Light of Myanmar, p.6. Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-03-07-red.pdf; and

Lawi Weng, (2017, March 7), "Analysis: Fractious Peace Process Lies Behind Kokang Clash", The Irrawaddy. Retrieved from: https://www.irrawaddy.com/news/burma/analysis-fractious-peace-process-lies-behind-kokang-clash.html.

The announcement from the National Reconciliation and Peace Centre was issued by its Chairperson, Aung San Suu Kyi.

The thirty killed were five civilians, five police officers and twenty rebel fighters. A statement from the Ministry of Defence said a number of Tatmadaw soldiers, including officers, were killed or injured.

[161] Shwe Yee Saw Myint and Yimou Lee, (2017, March 8), "Thousands flee Myanmar army clashes with insurgents near China, official says", Reuters. Retrieved from: http://www.reuters.com/article/us-myanmar-insurgency-china-idUSKBN16F0LD; and

governments of Burma and China, as Kokang has close ties with China, with the local residents speaking a Chinese dialect and using the Yuan as currency.[162] Tensions such as this are hardly conducive to the construction of a railway between China and Burma.

4.9 Information in the Public Arena about the Kunming-Kyaukphyu Line

Little is known about the planned line from Kunming to Muse in Burma, and from Muse to Kyaukphyu on the Arakan Coast of Burma. The first announcement came from the Chinese government in March 2011, and concerned the construction of a new line "from China to Burma".[163] This announcement was made by the Chinese commerce minister, Mr Chen Deming, who suggested construction would commence in late 2011. He told a delegation from China's Yunnan province that:[164]

> *we want to start construction this year and it [the Burma link] will be the first line to open.*

The description of this line as being "the first line to open" suggests that at that time it had a greater priority than the ones through Laos and Vietnam shown in Maps 10, 11 and 12. That priority has now changed. These lines are a part of China's grand plan for a system of railways, roads, power grids, telecommunication networks, oil and gas pipelines and ports to link China to its neighbouring countries.[165] Mr Chen Deming suggested that the start had been delayed due to internal problems in Burma (the new Government in place following the elections in November 2010), and mismatched gauges. The reference to gauge is interesting, as it is certain China wants to build a standard-gauge line, and this reference to the mismatched gauge suggests there may have been disagreement

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Blanchard, Ben, (2017, March 9), "China says more than 20,000 from Myanmar seek refuge across border", Reuters. Retrieved from: http://www.reuters.com/article/us-myanmar-insurgency-china-idUSKBN16G0QQ; and

Pomfret, James, (2017, March 13), "Relief camp in China swells as thousands flee conflict in Myanmar", Reuters. Retrieved from: http://www.reuters.com/article/us-myanmar-insurgency-china-refugees-idUSKBN16K0JW.

[162] *BBC News*, (2017, March 7), *op. cit*.

[163] *The Irrawaddy*, (2011, March 9), "China to Start Burma Rail Link". Retrieved from: http://www2.irrawaddy.org/article.php?art_id=20900.

[164] Allchin, Joseph, (2011, March 9), "Work to begin on China-Burma rail link", Democratic Voice of Burma. Retrieved from: http://www.dvb.no/news/work-to-begin-on-china-burma-rail-link/14665.

[165] *The Irrawaddy*, (2011, March 9), *op. cit.*

between the governments of China and Burma on what gauge the line should be within Burma.

4.10 The Political Economy of China's Railway Expansion into Burma

China's railway expansion into Burma, and more generally into Southeast Asia, can be seen in a historical context, as it is similar to the expansion by the French and British in the region over 100 years ago. An article in *The Economist* sums up this view succinctly:[166]

> *Empire-builders love railways. Most of South-East Asia's were laid during colonial rule, as Britain and France pushed inland. In a region with American leanings, China wants to bind its neighbours into an economic sphere with strategic weight. Laying lines into Myanmar, with a large but decrepit network, would add a coveted Indian Ocean port.*

There are two elements to the proposed line from China to Burma: freight and passengers. At the moment, the bulk of cargo being transported between China and Burma goes by road, in both directions. A large proportion of the trade between the two countries passes up and down the road between Mandalay and the border at Muse.[167] The trucks travelling the road are not large semi-trailers or B-doubles such as those that travel the roads in Australia. Rather they are smaller compact trucks such as shown in Plate 44. They need to be of this size to negotiate the hills and winding roads.

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[166] *The Economist*, (2011, January 20), "China coming down the tracks". Retrieved from: http://www.economist.com/node/17965601.

[167] *The Economist*, (2012, April 21), "The road up from Mandalay". Retrieved from: http://www.economist.com/node/21553091.

Plate 44: A truck travelling from Mandalay to China.

There are many vested interests with the existing highway, for example Asia World which operates the tollgates on the route from Mandalay to the border. The tollgate at Hsipaw is shown in Plate 45.

Plate 45: The tollgate operated by Asia World at Hsipaw, on the road from Mandalay to China.

An article in *The Economist* in 2012 highlighted that:[168]

[168] *The Economist*, (2012, April 21), *op. cit.*

The economic corridor that has grown up along the road affords a glimpse into Myanmar's warped and corrupt political economy, one that will be hard to unpick.

The tollgates are one aspect of the corruption that occurred under the former military regime. The eventual completion of this railway line could change the balance in these aspects of the political economy, with the exception of the illicit drug trade.

Freight is the key to the new line. Goods will come by sea into Kyaukphyu to be shipped to China. But another major item of freight is food that China purchases from Burma. This is all transported by road at present. In contrast to the large quantity of fruit and vegetables heading towards China, the trade in the other direction is mostly manufactured goods. The construction of the new railway should make the transport of these goods quicker and more efficient.

To see the potential for passenger travel, one can see what has happened with the Qinghai-Tibet Railway, which was controversially built by the Chinese and opened in July 2006. This is the world's highest railway, going through the Tanggula Pass which is 16,640 feet above sea level. In the six years after completion, growth rate in passenger numbers has been 10.3% per annum.[169] In 2006 there were 6.4 million passengers. By 2011 this number had risen to 10 million. In addition, 20 million tonnes of freight were transported on the line in 2011, an increase of 8% over 2010. The company operating the line, the Qinghai-Tibet Railway Company was projecting passenger numbers of 15 to 20 million by 2015. The line is 1,956 kilometres in length (about sixty per cent longer than the Kunming to Kyaukphyu line), and connects Xining (which is the capital of Qinghai Province) to Lhasa, the capital of Tibet. The attractions for Chinese tourists in Burma could be places such as Bagan with its 900-year-old temples (by comparison, the Chinese are a major part of the tourist traffic visiting Angkor Wat in Cambodia), or Inle Lake and the beach resorts such as Ngapali Beach and Ngwe Saung on the Arakan Coast. The development of casinos in Burma could also occur, targeting Chinese tourists.[170]

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[169] *Xinhua News Agency*, (2012, May 7), "Qinghai-Tibet Railway Transports 49 Mln Passengers Since Operation". Retrieved from: http://news.xinhuanet.com/english/china/2012-05/07/c_131573420.htm.

[170] There are already Chinese casinos in Mong La in Shan State, on the border with China, north-east of Kengtung. See for example:

An interesting aspect of the effects on the political economy of the eventual construction of a railway from Kunming to Kyaukphyu will be its impact on trade in the region. For example, the opening of the Yuxi-Mengzi line in Yunnan Province and the likelihood that this will lead to Kunming being connected to Singapore by rail has already raised concern in India. Dasgupta, writing in *The Times of India*, expressed the view that the prospect of a Kunming-Singapore rail link is "posing a threat to Indian exporters competing for market space with China".[171] He suggested that similar concerns will arise when the Kunming-Kyaukphyu line is built:

> *China also plans to build rail routes linking Kunming to Myanmar and, eventually, Bangladesh. On completion, it will create a grand alliance of Asian markets supporting each other, while expanding China's markets. The line will provide an impetus to trade which has slumped due to cancellation of purchase contracts by the recession-hit West.*

The argument is that by building a line from Kunming to Kyaukphyu and possibly extending it to Bangladesh, China will have much greater access to markets in the Southeast Asian region, and exporters in countries such as India may suffer. It is early days yet, and not all commentators are as pessimistic as Dasgupta. For example, Professor Abhijit Das, head of the Centre for WTO Studies at the Indian Institute of Foreign Trade, commenting on the Kunming-Singapore line, said that "the new line will make India's trade with the ASEAN market slightly more difficult". He holds the view that:[172]

> *China is faster in completing infrastructure projects. But India and China can work together to come to a mutually beneficial solution.*

There will be regional trade issues relating to India if a railway line from Kunming to Kyaukphyu is constructed, and probably also if a line is built from China through Burma to Assam or Manipur in north-east India.

Finch, Steve, (2014, March 10), "Burma's 'Wild East' Is a Debauched Land of Drugs and Vice That Reforms Forgot", Time. Retrieved from: http://time.com/17651/burmas-wild-east-is-a-debauched-land-of-drugs-and-vice-that-reforms-forgot/; and

Rose, Charlotte, (2016, March 11), "Visiting Mong La? This is why you shouldn't", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/opinion/19435-visiting-mong-la-this-is-why-you-shouldn-t.html.

[171] Dasgupta, Saibal, (2012, August 27), "China rail link to hit Indian exports", The Times of India. Retrieved from: http://timesofindia.indiatimes.com/world/china/Chinas-rail-link-to-hit-Indian-exports/articleshow/15788914.cms.

[172] Shukla, Shivangi, (2012, September 2), "China's rail link to Singapore intensifies exports race in S-E Asia", The Indian Express. Retrieved from: http://www.indianexpress.com/news/chinas-rail-link-to-singapore-intensifies-exports-race-in-se-asia/996540.

4.11 Conclusion

A railway line from China to Burma, more specifically from Kunming in China to Kyaukphyu in Burma, is something that has been dreamt of for over a century: first by the British, then the Chinese, and now Burma and China. The line, when and if it is built, will probably be as follows:

- Standard gauge, double track.
- Primarily for goods trains, running at a maximum speed of 120 km/hr.
- A large number of tunnels and viaducts, especially in the section from the China/Burma border to Mandalay.

What is apparent is that it will probably not happen soon. The line was announced with the signing of a Memorandum of Understanding between China and Burma in April 2011. Five months later on 30th September 2011, the political climate changed with the suspension of the Myitsone Dam by the new president, Thein Sein.[173] This reflects a major shift by Burma in its relations with China. On a visit by the President, Thein Sein, to China in September 2012 the proposed Kunming to Kyaukphyu Railway was not mentioned in the press releases, even though he had a stopover in Kunming, meeting the governor of Yunnan Province, Liu Jiheng, and members of the Yunnan Province Communist Party.[174]

This new railway does not seem to be high on the political agenda of the government of Burma at present. This may be changing however. At a Myanmar Construction Summit held in early 2014, the development of the commercial corridor linking Kyaukphyu to Yunnan Province in China was discussed.[175] This corridor includes the oil and gas pipelines, as well as rail and road links. In early 2014 the Ministry of Rail Transportation in Burma was reviewing a Chinese proposal to build the line, with the likelihood that it would be built under a Build-Operate-Transfer (BOT) scheme.[176] In April 2014 the chairman of China Railway

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[173] Ba Kaung, (2011, September 30), "Burmese President Halts Myitsone Dam Project", The Irrawaddy. Retrieved from: http://www2.irrawaddy.org/article.php?art_id=22172.

[174] Boehler, (2012, September 24), *op. cit.*; and

Mizzima, (2012, September 21), "Thein Sein opens China-Asean trade exhibition". Retrieved from: http://archive-2.mizzima.com/business/8071-thein-sein-opens-china-asean-trade-exhibition.html.

[175] Boot, William (2014, March 15), "Plans for Kyaukphyu-China Commercial Road, Rail Link 'Complete' ", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/business/irrawaddy-business-roundup-march-15-2014.html.

[176] Roughneen, Simon, (2014, March 18), "After Snubbing Loan, Burma Awaits China's Response on Road Link", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/business/snubbing-loan-burma-awaits-chinas-response-road-link.html.

Group, Mr Li Changjin, stated that the company was involved in a feasibility study of the China-Burma railway, and that construction had a good chance of starting soon.[177]

Even without this shift in relations between China and Burma, the practical issues of building the China-Burma Railway are huge. The line just opened from Yuxi to Mengzi in China, heading south to Vietnam, illustrates the issues that the China-Burma line will face. The Yuxi-Mengzi line, just 141 kilometres in length, took six years to build and cost over US$700 million, or about US$5 million per kilometre.[178] The planned China-Burma line is over 1,215 kilometres in length, with most of it being built in a country other than China. The potential of the line can be seen in what has been achieved with the Qinghai-Tibet Railway. To see the difficulties of building it one only has to look at the Yuxi-Mengzi-Hekou line being built in China and the planned China-Laos line. The latter also illustrates the political difficulties that must be overcome. It is clear that railway construction in the mountainous regions is a slow process, as can be seen by the length of time being taken to construct the Jiribam-Imphal line in India, or the Yuxi-Mengzi-Hekou line in Yunnan Province. The same will apply when construction commences on the Kunming-Kyaukphyu line. It is not only political issues that will slow the line's construction, but also the monumental difficulties of the terrain.

In June 2014 a report from the Ministry of Rail Transportation announced that survey work had begun on the China-Burma Railway.[179] But few details were given about the project. Interestingly, civic groups in Rakhine State were calling for a halt to the construction of the railway, fearing that resources from Rakhine State will be shipped to China.[180]

By July 2014 the China-Burma Railway was cancelled. There were two different versions as to why it was cancelled. The first was that it was cancelled for technical reasons because Burma and China had failed to implement the

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[177] Toh Han Shih, (2014, April 9), "China Railway bullish on overseas business", South China Morning Post. Retrieved from: http://www.scmp.com/business/china-business/article/1469891/china-railway-bullish-overseas-business.

[178] Horton, Chris, (2012, January 30), "Yuxi-Mengzi railroad to be operational this year", *GoKunming* website. Retrieved from: http://m.gokunming.com/en/blog/item/2567/yuximengzi_railroad_to_be_operational_this_year.

[179] *The Nation*, (2014, June 6), "Survey commences on railway to China". Retrieved from: http://www.nationmultimedia.com/aec/Survey-commences-on-railway-to-China-30235691.html.

[180] *Ibid*.

contract within three years of signing the Memorandum of Understanding.[181] China made no request to sign a new contract. The second reason, coming from the Ministry of Rail Transportation, was the potential cost and environmental impact, and the fact that communities would be displaced.[182] A third viewpoint would be a political one. Relations between China and Burma changed abruptly with the suspension of the Myitsone Dam. China backed away from the railway project because of this shift in the Burma-China relationship. From the Burmese side, there is clearly a risk to national security having a line running to a neighbouring country such as China. It is too easy for China to transport military equipment and troops into Burma if hostilities break out between the two countries.

The planned construction of the China-Burma Railway is possibly a part of a much grander plan from China. French refers to:[183]

> *the integration of south-east Asia into the Chinese rail network through Chinese-built railways in Vietnam, Cambodia, Thailand and Laos.*

French regards this rail expansion by China in Southeast Asia as one of China's "*new Silk Roads*" – the others being a maritime trade network and a transcontinental rail link to Europe. The desire of China to link its rail system to Southeast Asia using standard-gauge lines may ultimately be the driving force that sees the China-Burma line eventually constructed. What the reaction of India would be is unknown, as a rail line pushing through Burma to the Bay of Bengal can only strengthen China's presence in the Indian Ocean.

The example set by a recently opened line in Kenya could have real implications concerning the likelihood of the China-Burma line being built. In May 2017 a 472-kilometre line from Mombasa to Nairobi was opened in Kenya.[184] It is

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[181] *Eleven Myanmar*, (2014, July 19), "Kyaukphyu-Kunming Railway's Cancelled Due to Public Disapproval". Retrieved from: http://2bangkokforum.com/showthread.php?2494-Railwatch-New-Lines/page10.

[182] *Ibid*.

[183] French, Howard W., (2015, July 28), "What's behind Beijing's drive to control the South China Sea?", The Guardian. Retrieved from: http://www.theguardian.com/world/2015/jul/28/whats-behind-beijings-drive-control-south-china-sea-hainan.

[184] *BBC News,* (2017, May 31), *op. cit*.; and

Railway Gazette, (2017, May 31), "Mombasa-Nairobi Standard Gauge Railway opened". Retrieved from: http://www.railwaygazette.com/news/infrastructure/single-view/view/mombasa-nairobi-standard-gauge-railway-opened.html; and

TRT World, (2017, June 1), "Money Talks: Kenya opens Nairobi-Mombasa railway". A video recording on YouTube. Retrieved from: https://www.youtube.com/watch?v=NkJtcH2LMcA.

A good technical description of the line is given in Jackson's article in *Railway Gazette International* in June 2016. See:

a standard-gauge line, and construction which started in December 2014 cost US$3.2 billion. The line is a single-track line, designed for robustness and low maintenance, and can run passenger trains operating at 140 km/hr and goods trains at up to 80 km/hr.[185] A further US$3.6 billion has been secured from China to extend the line a further 250 *km* from Naivasha to Kisumu. However, concerns have been raised that it has cost too much to build the line.[186] At a cost of US$5.6m per kilometre, just for the track, this is three times the international standards and four times the original estimated cost.[187] Eighty per cent of cost has been funded by loans from China, loans that amount to approximately 6% of Kenya's Gross Domestic Product (GDP). In 2009 a Canadian consulting firm, Canadian Pacific Consulting Services, concluded that building a standard-gauge line in Kenya would be:[188]

> *"cost prohibitive" using "even the most optimistic" traffic and income projections.*

Most of the revenue for the new railway will come from transporting freight. At present only 5% of freight in Kenya is transported by rail, on an old railway line that runs parallel to the new one. The Kenyan government hopes to increase this figure to 40%, and may pass a law requiring that certain goods must be transported by rail. On the cost front, comparisons have been made with a recently built electrified line in nearby Ethiopia, which is 756 kilometres long but only cost US$3.4 billion to build compared to Kenya's cost of US$3.2 billion for a 472 kilometre line which is not electrified. But the Kenyan government has countered that the cost in Kenya was higher as the terrain required many tunnels and bridges, land compensation and a need for specifications to handle a larger amount of freight than the line in Ethiopia. The Kenyan government hopes the new line will boost Kenya's GDP by 1.5%.

China clearly has the expertise and the funds to build a railway such as the China-Burma line, although the geography from the border to Mandalay may be more challenging than the geography encountered in building the line in Kenya.

Jackson, (2016, June), *op. cit.*

[185] *Railway Gazette*, (2017, May 31), *op. cit*.

[186] Kacungira, Nancy, (2017, June 8), "Will Kenya get value for money from its new railway?", BBC News. Retrieved from: http://www.bbc.com/news/world-africa-40171095.

[187] *Ibid*.

[188] *Ibid*.

But the willpower for China to build such a project in Burma is so highly dependent on getting what it wants from the government in Nay Pyi Taw. If there is a model for the future China-Burma Railway, it is the new railway recently built in Kenya. But any future government in Burma will need to learn from the example of the line in Kenya. The terrain in Burma, especially between the border and Mandalay, will require many tunnels and bridges, as has happened in Kenya. Burma must be careful not to pay too much – either in financial terms or political terms.

In terms of priorities, it seems that at present China's priority for lines heading out from Kunming are firstly the China-Vietnam line, and secondly the China-Laos line, which will extend into Thailand. Both of these lines form part of the Pan-Asia Railway and will link Kunming to Singapore by rail eventually. The China-Burma line probably lies a distant third in priority after these two. Perhaps Sun-Yat Sen's dream of a line from south-west China to the Arakan Coast in Burma will be realised one day, but probably not in the next decade – but so much depends on China's willpower to build this line. It is not impossible it could occur in the next decade, given the Kenyan example.

Chapter 5

THE KYANGIN-PAKOKKU RAILWAY

5.1 Introduction

The west bank region of the Irrawaddy River in Burma is not as developed as the Irrawaddy Valley. One reason for this is that the main railway line in Burma, the line from Yangon to Mandalay, runs up the middle of the Irrawaddy Valley. The bulk of railway traffic in Burma is on this main line between Yangon and Mandalay, which extends to the north to Myitkyina, and south to Moulmein and Dawei. There are branch lines to the north-east to Lashio; to the east to Shwe Nyaung and Yaksauk; to the west to Pyay and Bagan, which are both on the east bank of the Irrawaddy River; and to the south-west to Pathein in the Irrawaddy Delta. Bagan is linked by rail to Pakokku by way of a new bridge built over the Irrawaddy River at Pakokku.

Pakokku and Kyangin both lie on the west bank of the Irrawaddy River, and are linked by the Kyangin-Pakokku Railway which is one of thirteen new railways that were planned for construction in Burma, as discussed in Chapter 1. These thirteen new railway projects had a total length of 2,265 miles. The railway between Kyangin and Pakokku is 512 kilometres long (320 miles) and construction has finished, with the railway having been built in stages, but only two of the four sections are useable. I have travelled on this line three times: in January 2013 and in December 2013, taking three days to travel between Pakokku and Kyangin; and again in January 2017 when I travelled from Pakokku to Seikphyu and back in one day. Sections of the Pakokku to Kyangin trips had to be completed by road due either to the railway line not being complete or being impassable. The full length of the line can be seen in Map 17 on the next page.[1]

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[1] This map is sourced from:

Nelles Verlag, (2016), "Map of Myanmar (Burma)", ISBN 978-3-86574-503-3.

Kyangin and Pakokku are indicated by red arrows. The blue arrows indicate Seikphyu, Minbu and Thayet which are important stations on the line.

Map 17: The line from Pakokku to Kyangin.

From Pakokku a line heads north-west to Kalaymyo, but it is not fully functional.[2] The line is blocked at the Ponnya Taung Railway Tunnel, which is 1,840 metres long and has collapsed.[3] The tunnel is not that old, having been constructed between 1997 and 2009.[4] A sign near the tunnel entrance is shown in Plate 46.

Plate 46: A sign at the Ponnya Taung Railway Tunnel, between Gangaw and Pakokku.

In December 2013 I travelled by train from Kalaymyo to Gangaw. A weekly service (on Saturdays) was at that time continuing on to Ye Myet Ni.[5] The station and track at Ye Myet Ni are in quite poor condition, as can be seen in Plate 47.

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[2] The line is broken between Kyawtha and Ye Myet Ni, which is a gap of 13 miles. See:

Wikipedia website, "List of railway stations in Myanmar". Retrieved from: http://en.wikipedia.org/wiki/List_of_railway_stations_in_Myanmar.

[3] Hettler, (2013, August), *op. cit*.

[4] *The New Light of Myanmar*, (1999, September 23), "Minister inspects construction of Ponnya Taung Tunnel". Retrieved from: http://www.burmalibrary.org/reg.burma/archives/199909/msg01032.html.

[5] I was informed by a Myanma Railways staff member in January 2017 when I was in Pakokku that the weekly service to Ye Myet Ni was no longer operating. This closure would be due to Myanma Railways' current policy of closing lightly-used rural lines. See:

Janssen, Peter, (2017, January), "From expansion to consolidation", Railway Gazette International, pp.50-52.

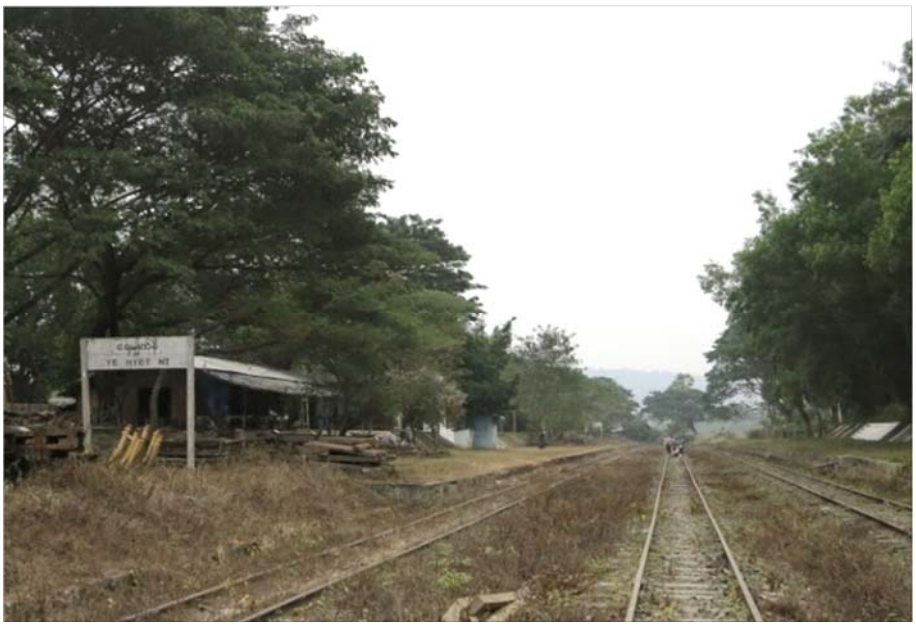

Plate 47: The railway station at Ye Myet Ni.

The line between Kalaymyo and Gangaw was seriously affected by the floods in August 2015.[6] From Pakokku the line runs north-west only as far as Kwaytha, a trip I also made in December 2013. The construction of the Kyangin-Pakokku line will be of greater value if the line from Kwaytha to Ye Myet Ni can be re-opened. The re-opening of this line was on the agenda for Myanma Railways, with work being proposed for 2015-2017, but only US$2 million was set aside for this work, which was described as "geo-engineering".[7] The repair or reconstruction of the Ponnya Taung Railway Tunnel is the key element. The tunnel passes under the Ponnya Mountain Range and is Burma's longest railway tunnel, with construction taking several years from 1997 to about 2009.[8] Repair of the tunnel will not be easy and will probably cost much more than the US$2 million set aside for this

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[6] Soe Win, (2015, August 19), *op. cit.*

[7] *Ministry of Rail Transportation*, (2014, October 13-15), *op. cit*.

To date, I have seen no evidence of any work being done to re-open this line.

[8] *The New Light of Myanmar*, (1997, April 18), "Senior General Than Shwe inspects infrastructural improvements for nationwide development". Retrieved from: http://www.burmalibrary.org/docs6/NLM1997-04-18-text.pdf; and

The New Light of Myanmar, (2006, June 28), "Minister inspects construction of Ponnya railway tunnel". Retrieved from: http://www.ibiblio.org/obl/docs2/NLM2006-06-28.pdf; and

The New Light of Myanmar, (2009, February 3), "Fields in Magway Division fed with underground water to meet per-acre yield target". Retrieved from: http://www.burmalibrary.org/docs6/NLM2009-02-03.pdf.

The military was also allegedly building three nuclear reactors 30 *km* from Kyaw, which is on the Pakokku-Kalaymyo line and is close to the Ponnya Taung Tunnel. See:

Min Lwin, (2010, May 15), "Burmese Reactors Close to Completion: Military Sources", The Irrawaddy. Retrieved from: http://www2.irrawaddy.org/article.php?art_id=18036.

task. But once this tunnel is operational again, it will enable Kalaymyo to be connected to the rest of the Myanma Railways network. The repair of this tunnel should be a high priority for Myanma Railways.[9] In September 2016 the Minister for Transport and Communications, U Thant Zin Maung, in response to a question in the Pyithu Hluttaw, indicated that the management of the tunnel would be transferred to the Ministry of Construction.[10] There is the possibility that when repaired it may be used for road as well as rail traffic. The Minister suggested the tunnel was unsuitable for road traffic, as traffic can only go in one direction at a time.

Another line heads north from Pakokku and crosses the Chindwin River to go to Monywa, from where one line goes to Mandalay and another line runs north to loop around via Ye-U to join the main line north to Myitkyina at Khin-U. The new line from Pakokku to Bagan enables passengers to travel to Bagan from Pakokku and then on to Yangon. Bagan is linked to Yangon either by the line via Pyinmana (on the Yangon-Mandalay line) or directly via Aunglan.[11] The absence of railway lines on the west bank of the Irrawaddy River (other than the two heading to Monywa and Kalaymyo from Pakokku) is an issue, as it restricts economic development of this region. The construction of a fully operational Kyangin-Pakokku line should be important for the economic development of the west bank region. The former military government was also of this view. In early 2011 Brigadier-General Soe Lwin (commander of the North-west Command) stated that the:[12]

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[9] The government seems to be giving priority to building a highway in this region, linking Gangaw and Monywa, including a 0.88 km long Ponnya Taung road tunnel. See:

The Global New Light of Myanmar, (2015, May 29), "KOICA-funded master plan for arterial road network development in Myanmar launched". Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-05-29.pdf.

[10] *The Global New Light of Myanmar*, (2016, September 6), "Pyithu Hluttaw hears answers to parliamentary questions by relevant ministries". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2016-09-06-red.pdf.

An alternative spelling of the Minister's name is U Thant Sin Maung.

[11] The trip from Yangon to Bagan is scheduled to take about 18½ hours. The No. 61 Up service departs Yangon at 4:00pm, and is scheduled to arrive in Bagan at 10:30am the next day. I last travelled this line in January 2017, and the train arrived at Bagan just before 12 noon, making it 20-hour trip. (The timetable sign at Yangon Central Railway Station gives an arrival time of 9:40am in Bagan, whereas the Railways Booking Office in Yangon where I purchased my ticket said it was 10:30am.) The Second-Class fare is 6,000 kyats.

[12] *The New Light of Myanmar,* (2011, February 27), "Kyunchaung-Daungtha section of Kyangin-Pakokku Railroad Project commissioned". Retrieved from: http://www.burmalibrary.org/docs11/NLM2011-02-27.pdf.

Ayeyawady Region, Bago Region, Magway Region and Sagaing Region on the west bank of the Ayeyawady River would witness sector-wise development like regions on the east bank of the river upon completion of the Pathein-Kyangin-Pakokku railroad.

A much better line than exists now will need to be built if development such as this is to be achieved.

Branch lines on the west bank of the Irrawaddy River such as the Mandalay-Monywa line; the Kalaymyo-Gangaw line; and the Pakokku-Kyawtha line mainly have smaller and older trains running on them, such as the ones shown in Plates 48 and 49 at Monywa Railway Station.

Plate 48: A train at Monywa Railway Station, waiting to depart for Khin-U.

Plate 49: The interior of one of the carriages on the train at Monywa Railway Station.

Some of the trains in service are very old. Passengers from Kalaymyo have to endure Local Rail Bus Engines (LRBE's) of the type shown in Plate 50.[13]

Plate 50: A Local Rail Bus Engine at Kalaymyo Station.

Other lines on the west bank of the Irrawaddy River such as the new Kyangin-Pakokku line and the Pathein-Einme line are operating modern diesel railcars.

5.2 Pakokku

Pakokku lies thirty kilometres east of Bagan, and is a busy market town on the Irrawaddy River with a population of about 90,800 people.[14] Pakokku is an important stopping-off point for river traffic moving up and down the Irrawaddy. Pakokku came to the attention of the international media in 2007 during the Saffron Revolution, with demonstrations in the town and monks turning their alms bowls upside down in an act of protest against the junta.[15] Pakokku also has a quite

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[13] This photograph was taken at Kalaymyo Station.

[14] *Department of Population, Ministry of Immigration and Population*, (2015, May), *op. cit*. p.57.

The figure quoted here is the urban population of Pakokku, which was recorded to be 90,842 in the 2014 census. In addition there was an urban population of 199,297 giving a total population for the Pakokku District of 290,139. Population figures quoted in this thesis for Yangon, Kalaymyo, Kyangin and Taunggyi are all for the urban population.

[15] Steinberg, David I., (2010), "Burma/Myanmar. What Everyone Needs to Know", Second Edition, Oxford University Press, New York, p.139; and

Shah Paung, (2007, September 6), "Monks Take Officials Hostage for Hours in Upper Burma Standoff", The Irrawaddy. Retrieved from: *http://www2.irrawaddy.org/article.php?art_id=8524*; and

active and visible branch of the National League for Democracy. Pakokku is the second most important educational centre for Buddhist monks after Mandalay, and is home to over eighty monasteries. Although Pakokku is located in Burma's dry zone, it is a fairly rich agricultural area with tobacco and cotton being the main crops. The Burmese government has designated Pakokku as a special zone for cotton cultivation.

A major bridge across the Irrawaddy River was completed in late 2011 at Pakokku, and is the longest bridge in Burma, at 19,457 feet (about six kilometres). Trains use the bridge as well as cars and other vehicles. The bridge lies on the proposed India-Myanmar-Thailand Trilateral Highway, and this is the main reason it was built.[16] The highway will run from Moreh in Manipur in India to Mae Sot in Thailand, and was due to be completed by 2016.[17] But there have been delays in construction, with India accusing Burma of creating hurdles to the project, and the deadline for completion is now 2020.[18] The completion of the bridge at Pakokku is very significant for Myanma Railways, as it enables lines on the east bank to be connected to existing lines on the west bank and to the Kyangin-Pakokku line.

The Irrawaddy, (2007, September 7), "Official Version of Pakokku Events Dismissed as Untrue". Retrieved from: http://www2.irrawaddy.org/article.php?art_id=8540.

[16] *The New Light of Myanmar*, (2011, December 25), "River-spanning bridges built in interests of nation and people. President U Thein Sein inspects progress in construction of Ayeyawady Bridge (Pakokku)". Retrieved from: http://www.burmalibrary.org/docs12/NLM2011-12-25.pdf; and

The New Light of Myanmar, (2010, June 14), "Prime Minister U Thein Sein Visits Ayeyawady Bridge (Pakokku) Project". Retrieved from: http://www.burmalibrary.org/docs09/NLM2010-06-14.pdf; and

News Track India, (2012, September 4), "India for fast-tracking ASEAN highway links". Retrieved from: http://www.newstrackindia.com/newsdetails/2012/09/04/378--India-for-fast-tracking-ASEAN-highway-links-.html.

The highway is also known as the India-Myanmar-Thailand Tripartite Highway.

[17] *Press Trust of India*, (2012, September 11), "India, Myanmar and Thailand discuss trilateral connectivity", Business Standard. Retrieved from: http://www.business-standard.com/generalnews/news/india-myanmarthailand-discuss-trilateral-connectivity/55190/; and

Channelnewsasia, (2012, August 14), "India grants Myanmar US$500m loan to build part of trilateral highway". Retrieved from: http://burmanationalnews.org/burma/index.php?option=com_content&view=article&id=2580:burma-related-news-august-15-2012&catid=37:burma-related-news.

[18] *The Hindu BusinessLine*, (2016, July 16), "Govt looking at extending India-Myanmar-Thailand Highway". Retrieved from: http://www.thehindubusinessline.com/economy/policy/govt-looking-at-extending-indiamyanmarthailand-highway/article8907574.ece; and

Financial Express, (2016, September 9), "MEA directed to monitor trilateral highway project". Retrieved from: http://www.financialexpress.com/economy/mea-directed-to-monitor-trilateral-highway-project/371637/; and

Bana, Naresh and K. Yhome, (2017, February), "The Road to Mekong: the India-Myanmar-Thailand Trilateral Highway Project", ORF Issue Brief, Issue No. 171. Retrieved from: http://www.orfonline.org/research/the-road-to-mekong-the-india-myanmar-thailand-trilateral-highway-project/.

Prior to this, the crossing to the west bank by rail could only be done across the Ava Bridge south of Mandalay. The new bridge at Pakokku is shown in Plate 51.

Plate 51: The new road and rail bridge over the Irrawaddy River at Pakokku.

Pakokku has a quite modern and sizeable railway station, as can be seen in Plate 52.[19]

Plate 52: The railway station at Pakokku.

[19] Stubbs, Lindsay, (2012, June 28), "Pakokku Railway Station". Unpublished manuscript, Macquarie University.

With the completion of the new bridge in late 2011, Pakokku is now linked by rail to Bagan, a trip of just over one hour by diesel railcar.[20] The fact that Pakokku Railway Station is quite modern compared to other railway stations in Burma, and the use of modern rolling stock, such as the diesel railcar shown in Plate 53, suggest that the government is placing some importance on Pakokku as a transport hub.

Plate 53: A modern diesel railcar waiting at Pakokku prior to departure for Bagan.

5.3 Kyangin

Kyangin is located on the west bank of the Irrawaddy River, about 240 kilometres north-west of Yangon. It is about sixty kilometres south of Pyay (formerly called Prome), and has a population of about 19,500 people.[21] The nearest major towns are Pyay and Hinthada. Kyangin is a major station on the line that runs north from Hinthada to Minbu and eventually to Pakokku, and from Pakokku to either Mandalay or Monywa.[22] The railway station at Kyangin is quite modern and functional and is shown in Plates 54 and 55.[23]

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[20] Stubbs, Lindsay, (2012, April 8), "The New Railway from Pakokku to Pagan". Unpublished manuscript, Macquarie University.

[21] *Department of Population, Ministry of Immigration and Population*, (2015, May), *op. cit.*, p.67.

[22] *The New Light of Myanmar*, (2010, October 28), *op. cit*.

[23] The train shown in Plate 55 was due to depart for Hinthada early the next morning. The line from Kyangin to Hinthada is an older but better built line, and trains such as this one are able to travel on it.

Plate 54: Kyangin Railway Station.

Plate 55: At Kyangin Railway Station.

At first glance, it would seem that the significance of the Kyangin-Pakokku line (if it did not have two gaps in it) is that trains can continue on to Pathein in the Irrawaddy Delta or to Yangon.[24] This is what Myanma Railways and the former government hoped that the public would think.[25] The reality is that two key sections

[24] The envisaged route to Yangon was the Hinthada-Yangon line which was opened in 2014 but is now closed.

[25] *The New Light of Myanmar*, (2010, June 14), "Kyangin-Pakokku railroad to link Ayeyawady west bank with delta, central Myanmar, northern Sagaing Div and Rakhine State", Retrieved from: http://www.burmalibrary.org/docs09/NLM2010-06-14.pdf.

of the line cannot be used, namely the Seikphyu-Minbu and Thayet-Kyangin sections. The plans are even grander than a line linking Pakokku to Pathein and Yangon, with the former government suggesting that the line will link the west bank of the Irrawaddy River with central Burma, northern Sagaing Division and Rakhine State.[26] The reality is that the line from Kyangin to Pakokku has gaps. In addition, only diesel railcars are currently travelling on the poor quality track.[27] Even if the line did not have major gaps, the track is not suitable for heavy locomotives and trains.

Kyangin is an important town in Burma for one reason: cement. Kyangin is the site of the second largest cement plant in Burma, the Kyangin Cement Plant, with an annual production capacity of 363,000 tonnes.[28] Other cement plants in Burma are shown in Table 46.[29]

Major Operating Company	Location of Plant	State or Region	Annual Capacity (000's Tonnes)
Myanmar Economic Co.	Hpa An	Kayin State	1,200
Myanmar Ceramic Industries	Kyangin	Ayeyarwady	363
Union of Myanmar Economic Holdings	Kyauske	Mandalay Region	330
Myanmar Economic Co.	Hpa An	Kayin State	240
AA Cement International	Kyauske	Mandalay Region	180
Dragon Cement	Pinlaung	Shan State	180
Myanmar Ceramic Industries	Thayet	Magway Region	170
Max Cement	Naypyidaw	Mandalay Region	150
Naypyidaw Development Committee	Naypyidaw	Mandalay Region	150
Yangon City Development Committee	Thazi	Mandalay Region	150
Mandalay Cement Industries	Kyauske	Mandalay Region	135
Myanmar Ceramic Industries	Kyauske	Mandalay Region	120
Tiger Cement	Kyauske	Mandalay Region	90
Union of Myanmar Economic Holdings	Kyauske	Mandalay Region	N/A
			3,458

Table 46: Cement plants in Burma.

[26] *Ibid*.

[27] At Minbu I saw a small goods train (being used for track maintenance) loaded with concrete sleepers manufactured at the plant adjacent to Minbu Station. This is the only train I have observed on this line other than the RBE's (Rail Bus Engine, i.e. diesel railcar). This goods train is shown in Plates 72 and 73 in this chapter.

[28] *Japan International Cooperation Agency*, (2002, October), *op. cit*.; and

Fong-Sam, Yolanda, (2014, November), "The Mineral Industry of Burma", 2012 Minerals Yearbook, Burma [Advance Release], U.S. Geological Survey. Retrieved from: http://minerals.usgs.gov/minerals/pubs/country/2012/myb3-2012-bm.pdf.

[29] Fong-Sam, (2014, November), *op. cit.*

Thayet is a major station on the new Kyangin-Pakokku line and is the site of a cement plant, with an annual capacity of 170,000 tonnes. The cement plants at Kyangin and Thayet are important in the context of concrete sleepers needed in the region for railway construction, and also for highway and bridge construction. The plant at Kyangin has been supplying cement to the domestic market for nearly thirty years, and its share of this domestic market was over 50% and sometimes was as high as 80% during the 1980's and 1990's. Data for the period 1985 to 2001 are shown in Table 47.[30]

Year	Kyangin Cement Plant Production (000's tonnes)	Production by Other Plants (000's tonnes)	Total Domestic Production (000's tonnes)	Kyangin Production as % of Total Production	Imports (000's tonnes)
1985	260	141	401	65%	2
1990	220	182	402	55%	2
1992	240	235	475	51%	75
1993	220	178	398	55%	140
1994	260	234	494	53%	216
1995	270	254	524	52%	285
1996	290	212	502	58%	590
1997	310	173	483	64%	1,047
1998	270	64	334	81%	346
1999	270	81	351	77%	416
2000			419		203
2001			379		384

Table 47: Cement production and imports in Burma.

From a railway point of view, the Kyangin Cement Plant is also interesting in that it has an electrified railway associated with the plant, running from the quarry to the cement plant, as well as passing near to Kyangin Railway Station. This line is shown in Plate 56.

[30] *Japan International Cooperation Agency*, (2002, October), *op. cit*.

The original source of data on imports and total domestic production for 1985-1999 is the *Statistical Yearbook 2000* for Burma. The figures for 2000 and 2001 are from the 2002 yearbook, cited below.

The Government of the Union of Myanmar, (2002, December), "Statistical Yearbook 2002", Central Statistical Organization, Ministry of National Planning and Economic Development, Yangon.

Plate 56: The electric railway near Kyangin Railway Station.

This is the only electrified railway in Burma. The track and overhead wires were still in place when I passed through Kyangin in January and December 2013. It may still be in operation as the rails showed recent use, but I did not see any train (diesel or electric) operating on the line.

In October 2010 the then Head of State, Senior General Than Shwe, visited Kyangin to inspect progress on the new Kyangin-Pakokku Railway. The visit included an inspection of the Kyangin Cement Plant, which highlights the importance of this cement plant within Burma. It was hoped that the completion of the Kyangin-Pakokku Railway would enable easier transportation of cement from the Kyangin Cement Plant to other parts of Burma, especially to infrastructure construction sites. The reality is the poor condition of the track on the Kyangin-Pakokku line will prevent this.

5.4 The Central Dry Zone

A key area in Magway Region is the Central Dry Zone, which extends over Magway and the adjoining regions of Mandalay and Sagaing, as shown in Map 18 on the next page.[31]

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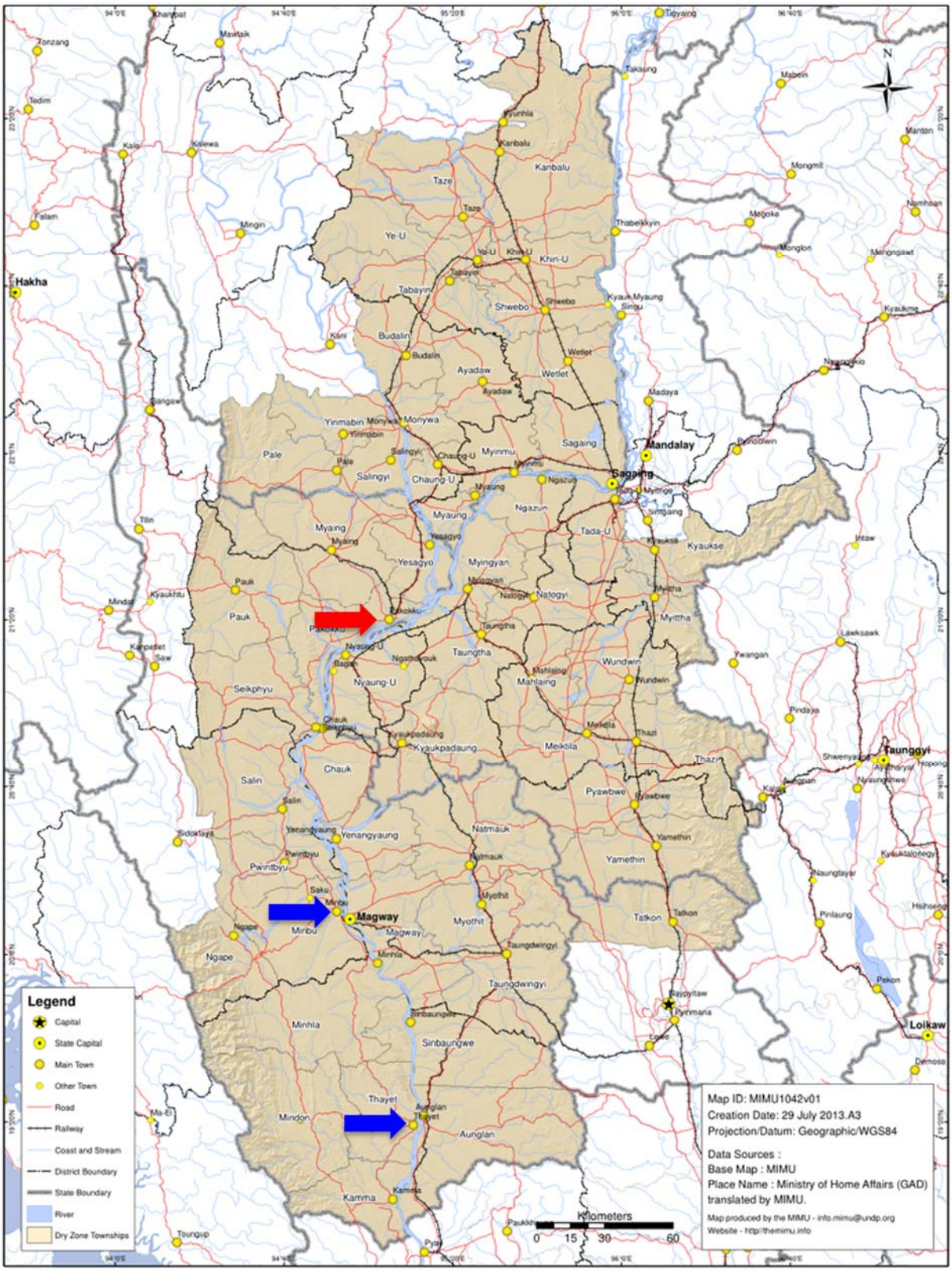
[31] This map is sourced from:

Adaption Fund, (2011, December 2), "Proposal for Myanmar". Retrieved from: https://www.adaptation-fund.org/wp-content/uploads/2015/01/AFB.PPRC .7.12%20Proposal%20for%20Myanmar.pdf.



Map 18: The Central Dry Zone in Burma.

Pakokku is indiacted by a red arrow on this map, and Minbu and Thayet by blue arrows, All are important stations on the Kyangin-Pakokku railway line. This map does not show the new Kyangin-Pakokku railway line.

The Central Dry Zone of Burma is very short of adequate domestic and agricultural water supplies.[32] This is another reason why the west bank region of the Irrawaddy River is less developed than the Irrawaddy Valley.[33] International agencies, such as the Japan International Cooperation Agency have been working for a number of years to stabilize the situation in this Central Dry Zone. Plate 57 below shows a sign near Mt Popa acknowledging an afforestation program in the Central Dry Zone funded by aid from Japan.[34]

Plate 57: The afforestation project near Mt Popa in the Central Dry Zone.

In this Central Dry Zone, it is common to see men pushing water carts or women walking long distances carrying heavy pails of water on their shoulders for domestic use. The construction of the Kyangin-Pakokku Railway will help open up the west bank region of the Irrawaddy River, but there are major challenges ahead for Burma to improve living conditions in the Central Dry Zone.[35]

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[32] *Japan International Cooperation Agency*, (2002), *op. cit*.; and

Japan International Cooperation Agency, (2012, July), "Water, Water Everywhere, But ……". Retrieved from: http://www.jica.go.jp/english/news/focus_on/myanmar2012/myanmar_07.html.

[33] The east bank of the Irrawaddy River, for example around Bagan or Mt Popa, is also very dry.

[34] This photograph was taken near Mt Popa, which is about 50 *km* from Bagan, in December 2008.

[35] *ReliefWeb*, (2010, August 17), "Myanmar: New action plan seeks to bring food security to Myanmar's Dry Zone." Retrieved from: http://reliefweb.int/report/myanmar/new-action-plan-seeks-bring-food-security-myanmars-dry-zone; and

Poe, Claudia Ah, (2011, February), "Food Security Assessment in the Dry Zone Myanmar", United Nations World Food Programme. Retrieved from: http://documents.wfp.org/stellent/groups/public/documents/ena/wfp234780.pdf.

5.5 Why the New Kyangin-Pakokku Railway is Important

The former military government claimed that the new Kyangin-Pakokku Railway will provide an important communication route for people living on the west bank of the Irrawaddy River. The former government's view was that:[36]

- The line will link the west bank of the Irrawaddy River to the Irrawaddy Delta, central Burma, northern Sagaing Division, and Rakhine State.
- It will link Pathein, the major city in the Irrawaddy Delta to Mandalay in the north, going via Kyangin and other towns on the west bank of the Irrawaddy River.
- In the north it will link up with the line from Pakokku to Kalaymyo, which is currently blocked due to the collapse of the Ponnya Taung Railway Tunnel.
- It enables the existing Pathein-Kyangin and Pakokku-Kalaymyo lines to be linked up.[37]
- In the south, the line passes through Minbu, and so will be able to link to the Sittwe-Minbu line that was also under construction at the time.

The connection to Sittwe on the Arakan coast is an important one, as the port at Sittwe is being developed and will see greater trade with India once the Kaladan Multi-modal Transport Transit Project is completed.[38] The estimated cost of the project was US$480 million.[39] The Essar Group from India is building a deep-sea port at Sittwe, and will dredge 225 kilometres of the Kaladan River as far as the

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[36] *The New Light of Myanmar*, (2010, June 14), "Kyangin-Pakokku railroad to link Ayeyawady west bank with delta, central Myanmar, northern Sagaing Div and Rakhine State", *op. cit*.; and

The New Light of Myanmar, (2012, January 31), "Kyangin-Pakokku Railroad linking north and south of Myanmar". Retrieved from: http://www.burmalibrary.org/docs13/NLM2012-01-31.pdf.

[37] In a press release on 27 November 2011 following the opening of the Ayeyawady Bridge at Pakokku, President U Thein Sein highlighted how the new Kyangin-Pakokku Railway will enable travel by train from Kalaymyo in the north, to Pakokku, Kyangin and Hinthada, a distance of 700 miles, with a further link to Pathein in the Irrawaddy Delta. See:

The New Light of Myanmar, (2011, November 28), *op. cit*.

[38] The project was due to be completed in 2014, but the completion date was delayed until December 2016. See:

Hammond, Clare, (2015, July 22), "Indian ambassador talks ports, roads and solar power, Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/business/15610-indian-ambassador-talks-ports-roads-and-solar-power.html; and

The Global New Light of Myanmar, (2016, November 10), "Kaladan Transport Transit Project expected to finish next month". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2016-11-10-red.pdf.

[39] *The Global New Light of Myanmar*, (2016, November 10), *op. cit*.; and

mitv News, (2016, November 10), "Sittwe Seaport: Progress Of Kaladan Multi-Modal Transit Transport Project". Retrieved from: http://www.myanmaritv.com/news/sittwe-seaport-progress-kaladan-multi-modal-transit-transport-project.

town of Paletwa. From Paletwa trucks will travel 158 kilometres to the Indian border.[40] This will open up a much shorter route from Kolkata to states in the north-east of India.[41] The port at Sittwe will be able to handle 20,000-ton vessels, compared to the 2,000 to 3,000-ton ships it handles at present.[42] In June 2017 six cargo vessels, each capable of transporting 300 tonnes, were donated to Inland Water Transport by the Indian government.[43] These vessels, which were valued at US$81 million, were constructed in Burma and were a part of the project agreement between the governments of India and Burma.[44] The vessels will transport cargo between Sittwe and Paletwa and should be in operation by the end of 2017, once the port has been dredged. The Kaladan Project is shown in Map 19.[45]

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[40] *The Global New Light of Myanmar*, (2016, November 10), *op. cit*.

[41] Hookway, James, (2012, November 2), "In Corner of Myanmar, Muslims Seek Relief", Wall Street Journal Online (Asian Edition). Retrieved from: http://online.wsj.com/article/SB10001424052970204707104578094500930170258.html?mod=WSJ_hp_MIDDLENexttoWhatsNewsForth; and

Stubbs, Lindsay, (2011, February 18), "Visit to Sittwe in February 2011). Unpublished manuscript, Macquarie University.

[42] Ramachandran, Sudha, (2013, September 21), "The Trouble With India's Projects in Myanmar", The Diplomat. Retrieved from: http://thediplomat.com/2016/09/the-trouble-with-indias-projects-in-myanmar/.

[43] *The Global New Light of Myanmar,* (2017, June 30), "Cargo vessels handed over to IWT". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-06-30-red.pdf.

[44] *Myanmar Times,* (2017, June 26), "India to hand over six vessels worth $81 million to Myanmar". Retrieved from: http://www.mmtimes.com/index.php/national-news/26541-india-to-hand-over-six-vessels-worth-81-million-to-myanmar.html.

[45] *Arakan Rivers Network*, "Kaladan Multi-Modal Transport Project". Retrieved from: http://www.arakanrivers.net/?page_id=135.

Map 19: The Kaladan Project, linking India and Burma.

The Essar Group was concerned in 2012 that the sectarian violence in Sittwe between the Muslim Rohingyas and Buddhists could severely disrupt this project.[46] Rakhine State has been embroiled in unrest in recent years over the Rohingya issue. The situation worsened in 2015, with many Rohingya leaving Burma by sea, with many perishing at sea but others ending up as refugees in Malaysia or Indonesia. By late 2016 the situation had worsened so much that the United Nations was warning that the reputation of the new NLD government was at stake, with international concerns at how it was dealing with the violence in the state.[47] Amnesty International accused the Burmese military of crimes against humanity towards the Rohingya Muslim minority, accusing the military of murdering civilians, rape, torture and looting.[48] There has been growing international pressure on

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[46] Hookway, (2012, November 2), *op. cit.*

Anti-Muslim sentiment is being stirred up by Buddhist monks in Burma. See:

BBC News, (2015, January 21), "Myanmar probes monk Wirathu's comments on UN envoy". Retrieved from: http://www.bbc.com/news/world-asia-30911124.

[47] Nichols, Michelle, (2016, November 30), "U.N. warns Myanmar government reputation at stake over Rohingya crisis", Reuters. Retrieved from: http://www.reuters.com/article/us-myanmar-rohingya-un-idUSKBN13O2VW.

[48] *BBC News*, (2016, December 19), "Amnesty accuses Myanmar of 'crimes against humanity' ". Retrieved from: http://www.bbc.com/news/world-asia-38362275; and

Malo, Sebastien, (2016, December 29), "End violence in Myanmar, Nobel laureates urge U.N. Security Council", Reuters. Retrieved from: http://www.reuters.com/article/us-myanmar-rohingya-letter-idUSKBN14I1UB.

The situation in Rakhine State has flared up again in August 2017, with hundreds of people, mostly Rohingyas, reportedly killed. The latest incidents are discussed in the Epilogue at the end of this thesis.

Burma to address the Rohingya problem, especially from the United States where President Obama wanted to see the transition of Burma to democracy as one of the legacies of his presidency.[49] President Obama's view was that Burma needs to end discrimination against the Rohingyas to succeed in its transition to democracy. By late 2016 the issue was being described as the first major crisis faced by the new NLD government, with the possibility of international censure of the NLD government, as well as conditions being attached to aid pledged to the new government.[50] From a railway perspective, Japan is pledging a substantial amount in aid and assistance, some targeted at railway development. If the US and Western countries attach conditions to their aid due to the Rohingya crisis, Japan may do the same even though it rarely raises human rights issues in its diplomatic dealings.[51]

A key objective of the former government for the railway from Kyangin to Pakokku was to put the west bank of the Irrawaddy River on a more equal footing from a socio-economic point of view with the east bank of the Irrawaddy River.[52] At present the main route to Mandalay is up the Irrawaddy Valley from Yangon, either by road or railway. This new route, though much smaller in size, quality and stature, was intended to provide an alternative route to Mandalay from the Irrawaddy Delta.

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[49] Edwards, Julia, (2015, June 2), "Obama Says Burma Needs to End Discrimination of Rohingya to Succeed", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/burma/obama-says-burma-needs-to-end-discrimination-of-rohingya-to-succeed.html.

[50] Robinson, Gwen, (2016, December 19), "Rakhine conflict changes Myanmar's game", Nikkei Asian Review. Retrieved from: http://asia.nikkei.com/Politics-Economy/International-Relations/Rakhine-conflict-changes-Myanmar-s-game; and

Chongkittavorn, Kavi, (2016, December 19), "Suu Kyi: Rakhine situation needs 'time, space and understanding' ", Nikkei Asian Review. Retrieved from: http://asia.nikkei.com/Politics-Economy/International-Relations/Suu-Kyi-Rakhine-situation-needs-time-space-and-understanding.

[51] Robinson, (2016, December 19), *op. cit.*

[52] *The New Light of Myanmar*, (2011, April 24), "Myanma Railways built new railroads and concrete sleeper factories for smooth transport, strengthening national consolidation and improving socio-economic status". www.burmalibrary.org/docs11/NLM2011-04-24.pdf.

5.6 Stages of Construction

The Kyangin to Pakokku Railway is divided into three major sections, as shown in Table 48.[53]

	Section	Length (Miles)
1	Kyangin - Thayet	110
2	Thayet - Pwintbyu	100
3	Pwintbyu - Pakokku	110
		320

Table 48: The three sections of the Kyangin-Pakokku Railway.

Construction of the railway commenced in 2007. There are various stages or sub-sections within each section. As at 31st January 2012 the following stages shown in Table 49 had been completed.[54]

	Section	Length (Miles)	Date Completed
1	Kyangin - Okshitbin	38	March 2008
2	Okshitbin - Kanma	35	March 2009
3	Kanma - Thayet	35	October 2009
4	Pakokku - Kyunchaung	27	November 2009
5	Thayet - Minhla	53	March 2010
6	Seikphyu - Yawchaung	22	June 2010
7	Minhla - Minbu	25	September 2010
8	Minbu - Pwintbyu	20	January 2011
9	Kyunchaung - Daungtha	20	February 2011
		275	

Table 49: Sections of the Kyangin-Pakokku Railway commissioned into service by early 2012.

In early 2012 two sections remained to be completed: the Pwintbyu-Hsinbyukyun section (20.5 miles) and the Kyunchaung-Yawchaung section (19.6 miles).

The Kyangin-Pakokku line passes through Minbu, a town that has appeared in the news frequently. There were rumours that North Korea was helping the

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[53] *The New Light of Myanmar*, (2012, January 31), *op. cit*.

Pwintbyu is in the Minbu District.

[54] *The New Light of Myanmar*, (2011, January 23), "Minbu-Pwintbyu railroad section of Kyangin-Pakokku railroad construction project commissioned into service". Retrieved from: http://www.burmalibrary.org/docs11/NLM2011-01-23.pdf; and

The New Light of Myanmar, (2012, January 31), *op. cit*.; and

The New Light of Myanmar, (2011, February 27), *op. cit*.

former military junta build a nuclear reactor near Minbu.[55] If there was any linkage with North Korea, this will have changed given the move by the former President, U Thein Sein, to have stronger relations with the US, as well as the election of the NLD government.[56] Minbu is also the terminus of the proposed Sittwe-Ann-Minbu railway.[57] On the Kyangin-Pakokku line, the Minhla to Minbu section of the railway which is 25.4 miles long, was opened in September 2010.[58] Lintner has highlighted the construction of this section of railway on the west bank of the Irrawaddy River.[59] It links Minhla in the Bago Region and Minbu in the Magway Region. Minhla is a small town to the south of Minbu. Lintner's view was that the railway had been built to transport heavy goods relating to the nearby production of Scud missiles, and possibly to supply Burma's nuclear program. The long-range Scud missiles were allegedly being constructed in a munitions factory at Minhla. Lintner reported in December 2011 that the missile program, which was allegedly attempting to

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[55] Kelley, Robert, (2010, June 3), "Expert says Burma 'planning nuclear bomb' ", Democratic Voice of Burma. Retrieved from: http://www.dvb.no/news/expert-says-burma-%E2%80%98planning-nuclear-bomb%E2%80%99/9527; and

Selth, Andrew, (2010, October 1), "Myanmar's Nuclear Ambitions", Survival: Global Politics and Strategy, October – November 2010, Vol. 52, pp.5-12. Retrieved from: https://www.iiss.org/en/publications/survival/sections/2010-e7df/survival--global-politics-and-strategy-october-november-2010-3f7f/52-5-02-selth-ccb7.

The Irrawaddy, (2007, June), "Burma's Nuclear Ambition", The Irrawaddy Magazine, Volume 15, No. 6. Retrieved from: http://www2.irrawaddy.org/article.php?art_id=7330; and

The Economist, (2010, June 10), "Myanmar's nuclear ambitions. Secrets will out". Retrieved from: http://www.economist.com/node/16321694; and

Wai Moe, (2010, January 10), "Junta-backed USDP Campaigning through Nargis Projects", The Irrawaddy. Retrieved from: http://election.irrawaddy.org/news/499--junta-backed-usdp-campaigning-through-nargis-projects-.html; and

Wai Moe, (2010, December 11), "US Cables Reveal Concern About Burma Nukes, N Korea Ties", The Irrawaddy. Retrieved from: http://www2.irrawaddy.org/article.php?art_id=20296.

[56] *The Irrawaddy*, (2012, October 24), "Burma on the 'Right Path' with North Korea: US". Retrieved from: http://www.irrawaddy.org/latest-news/burma-on-the-right-path-with-north-korea-us.html; and

Saw Yan Naing, (2012, November 26), "Burma Denies Nuclear Plan amid Japanese Claims", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/burma/burma-denies-nuclear-plan-amid-japanese-claims.html.

[57] Khin Oo Thar, (2010, November 24), "Mrauk U Pagodas Damaged by Railroad Construction", The Irrawaddy. Retrieved from: http://www2.irrawaddy.org/article.php?art_id=20166; and

Khin Oo Thar, (2010, December 23), "More Land in Arakan State Confiscated for Railway", The Irrawaddy. Retrieved from: http://www2.irrawaddy.org/article.php?art_id=20389.

[58] *The New Light of Myanmar*, (2010, September 20), "Better transport enables national brethren to have easy access to various regions. Minhla-Minbu railroad section of Kyangin-Pakokku Railroad Project inaugurated". Retrieved from: http://www.burmalibrary.org/docs09/NLM2010-09-20.pdf.

[59] Lintner, Bertil, (2011, March 2), "Myanmar, North Korea in missile nexus", Asia Times Online. Retrieved from: http://www.atimes.com/atimes/Southeast_Asia/MC02Ae01.html.

produce Scud missiles based on North Korean designs, was still ongoing.[60] In addition, Russian-trained Burmese officers were stationed at Minbu and were allegedly undertaking secret nuclear research.[61] The move towards democracy under the government of President U Thein Sein and the NLD government will probably see these nuclear ambitions change. In September 2013 the government signed an agreement with the UN's International Atomic Energy Agency that would allow it to declare all nuclear facilities and materials, and allow scrutiny by UN nuclear inspectors.[62]

The two black-and-white photographs below are from an article in *The New Light of Myanmar* reporting the opening in February 2011 of the Kyunchaung-Daungtha section of the line.[63] They are included here to show the type of terrain in which the line is being built. Plate 58 shows a part of the Kyunchaung-Daungtha section of the railway in very dry country.[64]

Plate 58: A train travelling on the Kyunchaung-Daungtha section of the new line on the day it was opened.

Plate 59 shows the hilly country through which the line has been built.

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[60] Lintner, Bertil, (2011, December 1), "US-Myanmar: Engagement as nuclear pre-emption", Asia Times Online. Retrieved from: http://www.atimes.com/atimes/Southeast_Asia/ML01Ae01.html.

[61] *Ibid*.

[62] Pennington, Matthew, (2012, November 21), "Burma Ready to Sign Nuclear Pact: Govt.", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/burma/burma-ready-to-sign-nuclear-pact-govt.html; and

Pennington, Matthew, (2013, September 20), "US Welcomes Burma Signing Nuclear Agreement", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/burma/us-welcomes-burma-signing-nuclear-agreement.html.

[63] *The New Light of Myanmar*, (2011, February 27), *op. cit*.

[64] *Ibid*.

Plate 59: Some of the dry hilly country through which the Kyangin-Pakokku line passes.

On the three occasions that I have travelled on this line, the train consisted of just one or two diesel railcars, not the four shown in the photographs from *The New Light of Myanmar*. With just one or two carriages, conditions are often cramped. I have travelled in single railcars on this line when travelling from Minbu to Thayet, and Thayet to Kyangin (for example, see Plate 16 in Chapter 3).

Construction of the new railway was not quick. The Seikphyu to Yawchaung section (22 miles) was completed in June 2010, and although only 22 miles in length it took three years to build it. This section was officially commissioned into service at a ceremony attended by the then Prime Minister U Thein Sein.[65]

One can only marvel at the misinformation put out by the government on the quality of the railways being built in Burma. In an article in *The New Light of Myanmar* in April 2011, the caption on a photograph of the Pakokku-Kyunchaung section of this line described the Kyangin Pakokku Railway as:[66]

> *A railroad network across the nation, put into service for smooth transportation and speedy flow of commodity.*

As is described later in this chapter, travelling on the line is hardly "smooth transportation". The only goods trains I have observed on the line are ones being used for track maintenance or for transporting concrete sleepers. The only commodities being transported were vegetables being carried by village women in the diesel railcars in use.

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[65] *The New Light of Myanmar*, (2010, June 14), "Kyangin-Pakokku railroad to link Ayeyawady west bank with delta, central Myanmar, northern Sagaing Div and Rakhine State", *op. cit*.

[66] Kyaw Ye Min, (2011, April 26), *op. cit*.

5.7 A Trip from Pakokku to Kyangin on the New Line

In January 2013 I travelled down the line from Monywa to Pakokku, and then from Pakokku to Kyangin. It was not possible to travel the full distance from Pakokku to Kyangin by rail, as the service was not operating between Seikphyu and Minbu. A summary of the trip is shown in Table 50.

Date	From	To	Depart	Arrive	Comments
12 January	Monywa	Pakokku	6:00am	6:40pm	Waited over 6 hours at Chaung U.
13 January					Stayed in Pakokku.
14 January	Pakokku	Seikphyu	5:30am	10:00am	From Seikphyu, transferred to Magway via Chauk by bus.
15 January	Minbu	Thayet	3:00pm	9:20pm	Slept in the Station Master's Rest at Thayet.
16 January	Thayet	Kyangin	5:30pm	4:25pm	Arrived at Pahyabaw at 9:50am, changed trains. Arrived at Kyangin at 4:25pm.

Table 50: The trip from Monywa to Kyangin via Pakokku.

When I repeated the trip from Pakokku to Kyangin in December of the same year, the line was blocked by a landslide between Phayabaw and Kyangin. The landslide had occurred six months before in the rainy season, but had still not been cleared. It was necessary to travel by bus from Phayabaw to Kyangin on this second trip. By January 2017 the whole sector between Thayet and Kyangin was closed.

5.7.1 Monywa to Pakokku

The trip started at Monywa, on the Chindwin River. The train, made up of two 30-year-old Japanese diesel railcars, left Monywa at 6:00am, and arrived at the junction at Chaung U at 7:00am. The diesel railcar is shown in Plate 60. The wooden sleepers at Chuang U Station are clearly visible in this photograph, mixed with the occasional concrete one. The continued use of wooden sleepers on the track in Burma is one aspect of the poor quality track throughout the country.

Plate 60: The 30-year-old diesel railcar at Chaung U Station.

From Chaung U I was supposed to catch a connecting train coming from Mandalay, departing Chaung U at 8:00am and arriving at Pakokku at 3:00pm. This information, which was provided at the station in Monywa, was very inaccurate. The train from Mandalay, going to Pakokku, finally arrived at 2:45pm and departed at 3:20pm for Pakokku. One of the problems with Myanma Railways, especially on the branch lines, is that trains do not run to time. This is a good example, and highlights an area where Myanma Railways needs to urgently improve. While I was waiting at Chaung U, a train passed through, on the way from Pakokku to Monywa. It was hauled by a German-manufactured Krupp locomotive DD.956, which was manufactured in 1978.[67] These locomotives, in use on the regional branch lines, are old and need replacing.

[67] This locomotive would be one of sixteen 900-horsepower locomotives which were acquired from Krupp Corporation in 1980. See:

Far Eastern Economic Review, (1981), "Far Eastern Economic Review Yearbook 1981", Hong Kong, p.118.

The locomotive, DD.956, shown in Plate 61 would be from the same batch.

Plate 61: The 1978 Krupp locomotive arriving at Chaung U Station.

Plate 62: The nameplate on the Krupp locomotive passing through Chaung U.

Both this 35-year-old locomotive and the 30-year-old Japanese railcars reflect the typical age of rolling stock used on the regional and smaller branch lines.

5.7.2 Pakokku to Seikphyu

The train from Pakokku to Seikphyu was a two-car diesel railcar, also of Japanese manufacture, and is shown in Plate 63.

Plate 63: A two-car diesel railcar at Kyun Chaung Station, on the way from Pakokku to Seikphyu.

This was much more modern than the one that I had travelled on from Monywa to Pakokku. The train departed from Pakokku at 5:30am, arriving at Seikphyu by 10:00am. It was noticeable that even though it was a new railway, only about one third of the sleepers were made of concrete, with the rest being wooden. This can be seen in the photograph in Plate 64, taken at Myit Che Station, a major stop on the line between Pakokku and Seikphyu.[68]

[68] The red arrows are indicating concrete sleepers. The three sleepers in between the two concrete ones are wooden sleepers.

Plate 64: The track consisted of about one-third concrete sleepers and two-thirds wooden sleepers.

The two carriages were crowded at all times, with many women travelling. A typical scene on the train is shown in Plate 65.

Plate 65: Passengers on the train from Pakokku to Seikphyu.

The line is certainly fulfilling the function of providing convenient cheap transport for villagers to travel to towns. The train was able to travel at a good speed on the track, at times travelling at 60 km/hr. What was alarming was the deteriorating condition of the track. By the time the train was two hours south of Pakokku, the track condition had deteriorated and was often covered by sand and/or dried mud, as can be seen in Plate 66.

Plate 66: The track covered in sand, south of Kyun Chaung.

In spite of the condition of the track, my travel diary records that the train was still travelling at 30 km/hr. At one stage, I could not see the metal rails as they were totally covered by sand and mud. Another example of this is shown in Plate 67. I was seated near the driver, and these photographs were taken through the front window of the train.

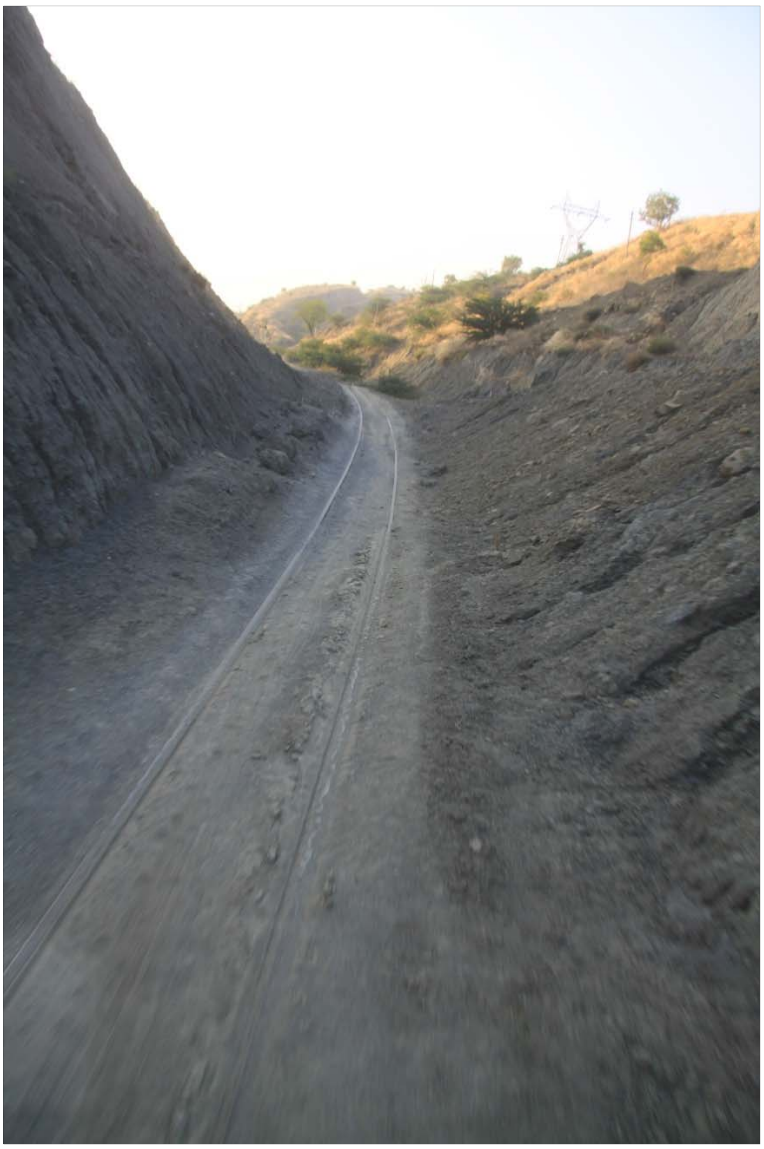

Plate 67: The track covered with mud, near Taut Ky Tang Station.

For a line that was built just four years before, it is rather disconcerting for the track to be in such a poor condition. In some places there were extra rails, known as checkrails, on the track to decrease the chance of derailment. An example is shown in Plate 68.

Plate 68: Check rails on the tracks.

A double rail like this is standard railway practice around the world, and is especially used on bridges where derailment could have catastrophic results.[69] The fact that Myanma Railways was using it on this section of the track highlights the concern about potential derailments. Derailments are frequent in Burma because of the age and condition of the track, but as speeds are usually slow there are few fatalities.[70] What is also apparent in Plate 68 is the dryness of the surrounding countryside. The former government suggested that the new railway will open up the west bank of the Irrawaddy River, but in areas like this that are so dry, economic development will be difficult.

Several people commented to me that the line was built for "political purposes", i.e. the government wanted to appear to be doing something for the region. The images above are in sharp contrast to the impressions that the photographs from *The New Light of Myanmar* in Plates 58 and 59 tried to convey. These try to convey an image of a well-constructed railway, along which reasonably long trains (e.g. four carriages) travel. In reality, the line is very poorly

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[69] My thanks to a senior engineer from CityRail in Sydney for this advice.

[70] For example, when I was a on a train that derailed in January 2012 shortly after leaving Hsipaw bound for Lashio, the train was travelling at only 10-15 km/hr. The carriage that derailed was the one I was travelling in, and did not topple over. The driver was quickly alerted and pulled the train up. Wooden blocks and jacks were brought forward from the guard's van at the rear of the train; the carriage was jacked up and levered back onto the rails; and remarkably we were underway in about 55 minutes from the time we were derailed. There were no injuries, let alone fatalities. The Myanma Railways' staff seemed well practised at these sort of occurrences. See:

Stubbs, (2012, April 21), *op. cit.*

constructed and the likelihood of a four-car travelling on the line in the near future is low.

5.7.3 Minbu to Thayet

From Seikphyu one must travel by road, crossing the Irrawaddy River to Chauk, from where a bus can be taken to Magway. After staying overnight in Magway, I then crossed back over to the west bank of the Irrawaddy River where I rejoined the rail service at Minbu. The rail connection between Seikphyu and Minbu is not complete. I was informed by the Station Master at Minbu that construction of the line between Seikphyu and Minbu was completed as far as Pwintbyu which is located about 20 miles north of Minbu, but that trains had stopped running on 20th June 2012 (i.e. seven months before my trip on the line).[71] I was told that the reason that the trains had stopped running was because they were losing money. There are also plans to build a line from Minbu to Sittwe in Rakhine State. This line is discussed in Chapter 8.

The station at Minbu is quite modern and large, as can be seen in Plate 69.

Plate 69: Minbu Railway Station.

On the trip in January 2013 the train was a single-car RBE which was manufactured in Japan and is shown in Plate 70.

[71] There was a small timetable on display at the station for the rail service from Minbu to Pwintbyu. The full timetable is recorded in Appendix E.

Plate 70: The single-car RBE that I travelled on from Minbu to Thayet.

My travel diary of 15th January 2013 notes that the speedometer was not operating, so one could not tell the speed of travel. Initially the speed was quite good, but after Latpan (about 3 hours south of Minbu) the notes in the travel diary indicate that we were only travelling at about 5-10 km/hr.

When I returned to Minbu in December 2013 the train in operation was a different model of RBE, with two carriages, as shown in Plate 71.[72]

[72] This is the same two-car RBE shown in Plate 15 in Chapter 3.

Plate 71: A two-car Japanese RBE at Minbu Railway Station.

Just to the north of the station is a concrete-sleeper plant that had been recently built. It was similar in design to a plant I saw under construction near Hsipaw on the Mandalay-Lashio line, and was also similar to the concrete-sleeper plant near the railway station at Shwe Nyaung in Shan State.[73] The plant at Minbu is shown in Plate 72.

Plate 72: A plant for manufacturing concrete sleepers, near Minbu Station.

[73] Stubbs, (2012, November 26), *op. cit*.

The plant at Minbu was supplying concrete sleepers for the construction of a branch line across the Irrawaddy River from Malun Junction on the Minbu-Thayet line to Migyaungye, a village on the east bank of the river. I observed this branch line just before Malun Junction Station, about 2 hours 20 mins south of Minbu. This road/rail bridge crossing the Irrawaddy River at Malun, known as the Ayeyawady Bridge (Malun), is 3,215 feet long and was opened in May 2013.[74] This bridge will enable easy access between Minhla on the west bank of the Irrawaddy River and Taungdwingyi on the east bank.[75] This road/rail bridge will also be of value to what is probably a defence services factory at Latpan, about 30 minutes south of Malun Junction. A Tatmadaw military police sergeant was on the platform at Latpan Railway Station checking the arrival of workers from the train on which I was travelling.[76]

The concrete sleepers were also being used for track repair. A goods train loaded with concrete sleepers is shown in Plate 73. It can also be seen in Plate 72 above.

Plate 73: The goods train loaded with concrete sleepers at Minbu Station.

Shortly after leaving Minbu Station there was repair work on the track, with new concrete sleepers replacing wooden ones, on a track becoming overgrown with

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[74] *The New Light of Myanmar*, (2013, May 12), "Better transportation brings about development of tourism industry and more job opportunities, thereby contributing to rural development and poverty alleviation". Retrieved from: http://www.burmalibrary.org/docs15/NLM-2013-05-12.pdf.

[75] *Ibid*.

[76] I acknowledge advice from Andrew Selth on the likely existence of this defence services factory.

weeds. This is on a "new" line only completed five years before in 2007/2008, illustrating the poor quality construction of the line in the first place. The state of the track here can be seen in Plate 74.

Plate 74: Track work just south of Minbu.

Some of the station buildings on the line between Minbu and Thayet were well built, such as the one at Pape Ye Ngan shown in Plate 75 below.[77]

Plate 75: Pape Ye Ngan Railway Station, about one hour south of Minbu.

[77] The building looked quite solid, but there were extensive cracks in the cement surface of the platform indicating poor construction. (One of the cracks is indicated by the red arrow in the photograph in Plate 75.)

This was the best station I saw between Minbu and Thayet. Others were of varying quality. See for example the station at Okshitpin shown in Plate 85 later in this chapter. I got the impression that the further one got from Minbu, the worse the quality of the stations and track.

The RBE was very crowded with passengers, as can be seen in Plate 76.

Plate 76: Overcrowding on the RBE travelling between Minbu and Thayet.

It was possibly overcrowding such as this that led to a two-car RBE being put into service later in that year.

On the line between Pakokku and Kyangin, many of the stations are in a poor state (including the track at the station), and often when the train pulls up adjacent to the platform the passengers find it difficult to board the train, as can be seen in Plate 77.[78]

[78] A similar situation can be seen in Plate 6 at Dama Thaw Station, also on the Thayet to Kyangin line.

Plate 77: Passengers boarding an RBE at Dan Gine Station, on the line between Thayet and Kyangin.

Scenes such as the one shown in Plate 77 are unfortunately commonplace on this so-called "new" line.

The trip from Minbu was a precarious one. As darkness fell, often the RBE was rocking, necessitating it to travel at only 5-10 km/hr. I was sitting at the front of the RBE near the driver and could see the track ahead in the engine's headlight. Often it was overgrown with weeds and at other times the rails were covered with mud and I could barely see the rails. An example is shown in Plate 78.[79]

[79] This photograph was taken at 8:20pm on 29th December 2013, about 1 hour 15 minutes north of Thayet.

Plate 78: The track covered in mud and sand, with the rails barely visible.

The small stations we stopped at had little if no lighting, such as the one shown in Plate 79, where the people waiting were using torches to see. The condition of the track at this station was also very poor.

Plate 79: A station with no lights, about one hour north of Thayet.

The track between Minbu and Thayet was in such a poor condition that it was dangerous to travel on. The photographs in Plates 78 and 79 above are from my second trip on this line in December 2013. This is just five years after the line was built.

5.7.4 Thayet to Kyangin

After staying overnight in the Station Master's Rest at Thayet Station, I departed at 5:30am the next morning for Phayabaw. Quite a number of women and children had slept out in the cold all night in front of the ticket office, waiting for the 5:00am train to Minbu or the 5:30am one to Phayabaw. No waiting room was available for them to sleep in. Some of the women are shown in Plate 80.

Plate 80: Women at Thayet Station at 4:30am, having slept outside in the cold all night.

The train I travelled on was a single-carriage Japanese RBE.2531, which is the oldest RBE I have travelled on in Burma. The RBE is shown in Plate 81, and its interior (which gives away its age) in Plate 82.

Plate 81: RBE.2531 at Pyayet Station on the Thayet-Phayabaw line.

Plate 82: The interior of RBE.2531.

The trip to Kyangin was completed in two stages: first to Phayabaw, arriving there at 9:50am. After a wait of two hours, I departed on a different RBE, arriving at Kyangin at 4:25pm. The landscape along the way was becoming more fertile as we headed south towards the Irrawaddy Delta. Overall, the track was better than the Minbu-Thayet line, but there were still sections overgrown with weeds, where the maximum speed allowed was 5 miles/hour. My travel diary indicates that the rails on the track were moving up and down on one section of the track

near the village of Khee Pikan, just north of Phayabaw. This part of the track is shown in Plate 83.[80]

Plate 83: The very poor condition of the track, just north of Phayabaw.

Phayabaw Station was quite small even though it is an important station on this line. The station building is in good condition but there were weeds growing over the track and platform, as can be seen in Plate 84.[81]

Plate 84: At Phayabaw Station.

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[80] This photograph was taken from the front of the RBE as it was travelling along the track. One can stand or sit next to the driver's compartment on the RBE's.

[81] The sign at Phayabaw Station was spelt "Pahyabaw" rather than "Phayabaw".

The track between Thayet and Phayabaw was built in 2007/2008, and the train had to travel quite slowly due to the poor condition of the track. This track is a part of the main line of Myanma Railways on the west bank of the Irrawaddy River: to have built a track as poorly as this highlights the lack of funding and lack of commitment of the government in Nay Pyi Taw. Too often it seems that new railway lines are planned or built to placate the local population, but the result is a poorly constructed and neglected railway. Already the Kyangin-Pakokku line is becoming as bad as the Aungban-Loikaw line. The latter is over twenty years old, whereas the Kyangin-Pakokku line is just seven years old. Not only was the track bad in places (such as shown in Plates 78 and 79 above), but many stations were often in a very run-down condition. The stations south of Phayabaw, between Phayabaw and Kyangin, were older than ones on other parts of the line, as this part of the line was built at the start of the construction of the Kyangin-Pakokku line. Unfortunately, the stations had deteriorated badly and sometimes were covered in weeds. One station between Padaung and Okshitpin had been abandoned: the station building was in a bad state of repair and bushes were growing on the station platform. Further on down the line, two stations were badly overgrown with weeds and appeared to be unstaffed. One of these, a station one hour south of Okshitpin, is shown in Plate 85.

Plate 85: A station south of Okshitpin, badly overgrown with weeds.

The second station, at Htauk Kyuant Ka which is about three hours south of Phayabaw, was even more overgrown with weeds, as can be seen in Plate 86.

Plate 86: The station at Htauk Kyuant Ka, on the line between Phayabaw and Kyangin.

Neither of these stations appeared to be staffed and certainly no upkeep of the stations was occurring, but they were still being used by Myanma Railways to pick up and drop off passengers, and are probably still counted as functional stations in the statistics published by Myanma Railways and the Central Statistical Organization. Parts of the track on this section of the line were in equally poor condition, as can be seen in Plate 87.[82]

[82] The photograph was taken as the RBE was travelling (very slowly) along the track. The front of the RBE can be seen on the left-hand side of the photograph.

Plate 87: A dangerous part of the track, north of Kyangin.

This section of the track was clearly dangerous. What is quite apparent after travelling down the line from Pakokku to Kyangin twice is that there is a lack of funding for track repair and general maintenance (e.g. at the stations).

Approaching Kyangin we passed the electrified line for the cement mill, which is shown in Plate 88.

Plate 88: The electrified line from the cement mill at Kyangin.

The driver of the RBE said that the electrified line was not being used. We arrived at Kyangin at 4:25pm, and departed for Hinthada at 4:53pm. The line from Kyangin to Hinthada was a much older line and we were able to travel more quickly and smoothly, arriving at Hinthada at 6:45pm. There were several quite sizable stations on this line, such as the one at Myanaung shown in Plate 89.

Plate 89: The station at Myanaung, on the Kyangin-Hinthada line.

The quality of the line from Kyangin to Hinthada contrasted greatly to the line I had just travelled on that day from Thayet to Kyangin. A mixed passenger/goods train was parked at Kyangin ready for a 4:00am departure the next morning to Pathein

(this is the one shown at the start of this chapter in Plate 55). It would not be safe for such trains to travel on the Thayet to Kyangin line, given the state of the track.

5.8 The State of the Line in Early 2017

By January 2017 only two of the four sections between Pakokku and Kyangin were operating.

- Pakokku to Seikphyu. There is a daily service, which is scheduled to leave Pakokku at 5:00am, arriving at Seikphyu at 10:15am. The return trip leaves Seikphyu at 2:00pm and arrives at Pakokku at 7:15pm.[83]
- Seikphyu to Minbu. Apparently there is a track between these two towns, but I have never seen it in operation. Passengers need to take a pick-up to Chauk, bus to Magway and a pick-up to Minbu to connect with the rail service there. The service from Minbu to Pwintbyu is reported to still be operating.[84]
- Minbu to Thayet. This service is still operating. The train departs from Minbu at 1:00pm and is due at Thayet at 6:25pm.
- Thayet to Kyangin. This section is now closed due to the poor track condition. A year earlier it was operating, but with a landslide blocking a part of the track.

This line was completed by 2012, with the various sections having been opened by the former military government with much fanfare over the years of construction.[85] The fact that two of the four sectors are now not operating is consistent with the current policy of Myanma Railways, namely concentrating on a few key projects such as the Circular Railway in Yangon and the Yangon-to-Mandalay line.[86] Janssen notes that twenty-four rail services were withdrawn by

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[83] I travelled from Pakokku to Seikphyu and back on 20th January 2017.

[84] Nay Aung, (2017, August 4), "The sham tram. The damning planning of the Kyangin-Pakokku railway project", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/lifestyle/27110-the-sham-tram.html.

This article states that the service from Minbu to Pwintbyu is still operating, which differs to information given to me by the Station Master at Minbu Station in January 2013. Perhaps by 2017 it is operating again.

[85] See for example:

The New Light of Myanmar, (2011, February 27), *op. cit.*; and

The New Light of Myanmar, (2012, January 31), *op. cit*.

[86] Janssen, (2017, January), *op. cit*.

Myanma Railways in the second half of 2016, as the routes were lightly used.[87] The Thayet to Kyangin line was closed because of the bad condition of the track but it probably counts as one of the twenty-four lines referred to by Janssen as being closed because of light usage. On a field trip to Burma in January and February 2017 I noted a tendency of Myanma Railways staff to say a certain line had been closed because of "no passengers". Often when pressed, they admitted it was the poor condition of the track that caused the closure of the line.

5.9 Conclusion

From Myanma Railways' point of view the construction of the Kyangin-Pakokku Railway is now complete, even though two sections are unusable. The construction of the Kyangin-Pakokku line started in the south and worked northwards, with the route being opened in sections, as was indicated in Table 49.[88] The Kyunchaung-Daungtha section opened in February 2011 was the tenth section of the line to be opened.[89] On my two trips along the line in 2013, there was no rail service between Seikphyu and Minbu, and I had to cover this section by road. I was told by the Station Master at Minbu that the line had been built as far as Pwintbyu, 20 miles north of Minbu, but was not operating for financial reasons.[90] Plate 90 shows the line extending north from Minbu towards Pwintbyu.[91]

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[87] *Ibid*., p.52.

[88] Hettler, (2013, August), *op. cit.*

[89] *The New Light of Myanmar*, (2011, February 27), *op. cit*.

[90] Hettler stated in 2013 that the last gap in the Kyangin-Pakokku line was closed near Kyunchaung on 26th February 2011. However an article in *The New Light of Myanmar* dated 27th February 2011, describing the opening of the Kyunchaung-Daungtha section of the line, clearly states that the Pwintbyu-Hsinbyugyun section was yet to be completed, which is consistent with the information I was given. See:

Hettler, (2013, August), *op. cit.*; and

The New Light of Myanmar, (2011, February 27), *op. cit*.

[91] The concrete-sleeper plant can be seen on the right-hand side in this photograph.

Plate 90: The line extending north from Minbu towards Pwintbyu.

This section from Minbu to Pwintbyu was opened with much fanfare in January 2011.[92] There is probably a section of the line north of Pwintbyu that is still to be completed. There is also the section between Phayabaw and Kyangin, which was blocked by a landslide but had not been repaired as at December 2013. As of January 2017 the service between Thayet and Kyangin was suspended. There was never any grand opening ceremony for this railway, reflecting I would think the fact that a train could not run all the way from Pakokku to Kyangin, due to the poor quality of the construction.

The press has picked up on the state of the railway from Kyangin to Pakokku. An article in the *Myanmar Times* in August 2017 used a heading "*The damning planning of the Kyangin-Pakokku railway project*".[93] The author, Nay Aung, stated that the line was opened with on 26th February 2011 but is now unusable in many parts.[94] The author claimed that trains only run between Minbu and Pwintbyu, a distance of about 20 miles. But in fact other major sections of the line are in use, for example the line from Pakokku to Seikphyu, and the line from Thayet to

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[92] *The New Light of Myanmar*, (2011, January 23), *op. cit*.

[93] Nay Aung, (2017, August 4), *op. cit.*

[94] The ceremony on 26th February 2011 was to open the Kyunchaung-Daungtha section of the railway, the tenth section to be completed. At that time, the Pwintbyu-Hsinbyugyun section of the line still remained to be completed. See:

The New Light of Myanmar, (2011, February 27), *op. cit*.

Kyangin. However, the author raises two other very interesting issues. The first is that 4,000 acres of land were confiscated from farmers for the project.[95] The second is that railway construction has disrupted water flows. One farmer from Pwintbyu is quoted as saying:[96]

> *"We've cultivated on the bank of Mone creek for our whole life and we've never suffered crop damage. But since the railway was constructed, we've become the victims of seasonal floods".*

Many creeks in the region around Pwintbyu originate in the hills in the west of Magway Region. Because the railway has been built parallel to the Irrawaddy River, these water flows have been disrupted. The railway acts as a dam:[97]

> *depriving crops of the water they need during dry season and flooding them during the monsoon.*

Clearly much work needs to get this railway back to being fully operational. Whether Myanma Railways has the willpower or funds to do so remains to be seen.

The Kyangin-Pakokku Railway was a high profile project for the government of Burma in 2010, and there were inspections by Senior General Than Shwe and the then Prime Minister U Thein Sein.[98] However, the rapidly changing political climate in Burma since the national elections in November 2011 saw President U Thein Sein and his government occupied with much bigger issues. Construction of the Kyangin-Pakokku line has been completed, but it has been so poorly built that two sections are unusable and the line is now of questionable value to the region. It enables villagers to travel between rural towns and villages on the two sections that are operating, but it is of little value for freight transport.[99] It can hardly

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[95] In 2018 farmers in Pakokku were compensated with K114.8 million for 76.6 acres of land confiscated in 2006 when construction began on the Pakokku-Kyunchaung section of the Kyangin-Pakokku Railway. The funds were given to farmers from eight different villages. See:

The Global New Light of Myanmar", (2018, April 9), "Pakokku farmers receive compensation for confiscated farmlands". Retrieved from: http://www.burmalibrary.org/docs24/GNLM2018-04-09-red.pdf.

[96] *Ibid*.

[97] *Ibid*.

[98] *The New Light of Myanmar*, (2010, September 20), *op. cit*.; and

The New Light of Myanmar, (2010, October 28), *op. cit*.

[99] In August 2016 Myanma Railways announced the closure of several small rural services, including the Phayabaw-Thayet goods train and the Hinthada-Phayabaw goods train, both of which ceased operation on 11th June 2016. I have not seen either of these services in operation, and am surprised they could operate on the poor quality track. See:

be described as helping to open up the west bank of the Irrawaddy River as the former government in Nay Pyi Taw wanted the public to believe.

Htoo Thant, (2016, August 18), "Sixteen rail routes closed during 100-day plan", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/national-news/22015-sixteen-rail-routes-closed-during-100-day-plan.html.

Chapter 6

BY RAIL TO LOIKAW
A CASE STUDY OF A RURAL LINE

6.1 Introduction

Aungban is a junction town situated on the rail line from Thazi to Shwe Nyaung and Yaksauk in Shan State.[1] Aungban has been described as a junction town. One road leads north to Pindaya, a popular tourist destination but also an important agricultural region. The road and rail push east to Shwe Nyaung from where it is a short trip by road to Taunggyi, the capital of Shan State or to Nyaung Shwe, near Inle Lake. Heading south there is a rail and road link to Loikaw, the capital of Kayah State. To the west is the major town of Kalaw, linked to Aungban by road and rail. A map of the region is shown below. Loikaw lies 102 miles south of Aungban and is just south of the border with Shan State. Kayah State, formerly known as Karenni State, is a small state that is home to numerous tribal groups such as the Padaung, Yinbaw, Kayin and Karenni.[2] A rail line was opened between Aungban and Loikaw in 1992, and is shown in Map 20 below.[3]

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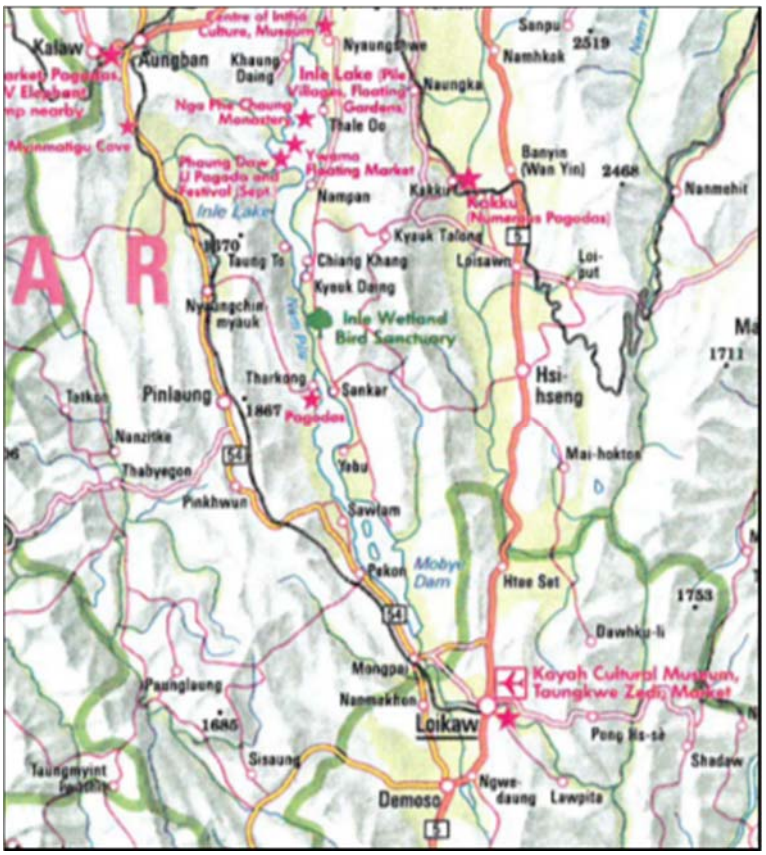
[1] This chapter is dedicated to the memory of the late Ma Nwe Lin Shein, tour guide, who was tragically killed when Air Bagan Flight 11 crashed at Heho Airport on Christmas Day, 2012 – the day before I travelled from Aungban to Loikaw by train. I was in Aungban on the day of the crash. Aungban is quite close to Heho, and there was an electricity blackout in Aungban due to the crash at Heho bringing down power lines. Ma Nwe Lin Shein had been my tour guide in Yangon for a day in December 2008, taking me on a walking tour of colonial buildings in downtown Yangon.

[2] *Lonely Planet*, (2017, July), "Lonely Planet Myanmar (Burma)", 13th ed., Lonely Planet Global Limited, Ireland, p.229.

[3] This map is from a *Nelles Verlag* map of Myanmar (Burma), published in 2016. See:

Nelles Verlag, (2016), *op. cit*.



Map 20: The railway line from Aungban to Loikaw, the capital of Kayah State.

This line was constructed whilst the military junta was in power, whereas many other lines were constructed by the British during the colonial period. The purpose of this chapter is to examine the state of the Aungban-Loikaw line today, over twenty years after it was opened, to see what condition it is in and how efficient it is.

6.2 A Paper by Jean-Marc Rastorfer in 1992

In December 1991 Jean-Marc Rastorfer inspected the Aungban to Loikaw Railway which was under construction, linking Shan State to Kayah State.[4] Rastorfer was a Swiss civil engineer who specialised in railway engineering, but he was also an academic who conducted research on Kayah State. Rastorfer presented a paper

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[4] Rastorfer, (1992), *op. cit.*

Hettler states that the Aungban-Loikaw line was opened in 1965, but this is contrary to the paper by Rastorfer, and other evidence. See:

Hettler, (2013, August), *op. cit.*; and

Burma Alert, (1992, November), "Slave labour on Aung Ban – Loikaw railway confirmed", No. 11, Volume 3, The Associates to Develop Democratic Burma. Retrieved from: http://www.ibiblio.org/obl/docs/BA1992-11.pdf.

entitled "*By Rail to Loikaw?"* at a Colloquium on Burma Studies at Northern Illinois University in November 1992. He had observed development in Kayah State for many years, and was interested in the fact that it was linking Shan State to Kayah State. Rastorfer was also interested in the construction of the line in hilly conditions. Rastorfer visited the line for just one day, travelling by road to a construction camp about twenty miles south-west of Aungban. The railway was built at a time when SLORC was the governing body of Burma.[5] SLORC apparently set a tight schedule for the completion of the line, and there were reports from diplomats at the time that 12,000 villagers were used as slave labour during construction.[6] The construction of the line from Aungban to Loikaw; the extension of the line in Shan State from Shwe Nyaung to Yaksauk; and the construction of the Ye to Tavoy line were the three most important railway developments following the military take-over in September 1988.[7]

6.3 Travelling from Aungban to Loikaw in December 2012

I travelled from Aungban to Loikaw by rail on 26th December 2012, and returned, also by rail, two days later. The train departed at just after 10:30am from Aungban and arrived at Loikaw at 9:50pm, a trip of 11 hours and 20 minutes. The distance

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[5] The State Law and Order Restoration Council (SLORC) was the governing body of Burma from 1988 to 1997. See:

Steinberg, (2013), *op. cit.*, Chapter 6, pp.82-148.

[6] *Burma Alert*, (1992, November), *op. cit.*; and

Hseng Khio Fah, (2008, December 8), "Villagers apprehensive of junta's railroad plan between Kengtung-Namzang", Burma News International. Retrieved from: http://e-archive.bnionline.net/index.php/news/shan/5523-villagers-apprehensive-of-juntas-railroad-plan-between-kengtung-namzang.html.

Forced labour of approximately 120,000 people was also reportedly used to build 177 *km* of embankment for the Ye-Tavoy Railway. See:

Anonymous, (1994, April), "Ye-Tavoy Railway Construction. Report on Forced Labour in the Mon State and Tenasserim Division in Burma". *(A copy of this report is in my possession)*. This report is also available at:

Anonymous, (1994, May 8), "Ye-Tavoy Railway Report. April, 1994." Retrieved from: http://www.burmalibrary.org/reg.burma/archives/199405/msg00040.html and http://www.burmalibrary.org/reg.burma/archives/199405/msg00041.html. This report is in two parts, and has a preface by R. Strider of *Burmanet*, but does not contain the seven coloured photographs of the above hard copy of the report.

Mullen, Christopher A. and J. Atticus Ryan (eds.), (1997), "Unrepresented Nations and Peoples Organization. Yearbook 1996: Volume 2", The Hague: Kluwer Law International, p.105; and

Karen Human Rights Group, (1994, April 13), "The Ye-Tavoy Railway". Retrieved from: http://khrg.org/1994/04/940413/ye-tavoy-railway.

[7] Rastorfer, (1992), *op. cit.*

travelled was 102 miles, so this represents an average speed of just 9 miles per hour. The return trip was just as slow, departing Loikaw 5 minutes late at 5:50am and arriving at Aungban at 4:50pm, a trip of 11 hours at an average speed of 9.3 miles per hour. The actual times for the trip from Aungban to Loikaw are shown in Table 51.

Town	Arrive or Depart	Time	Distance from Yangon (Miles)
Aungban	Depart	10:33am	376
Inn Wun		11:51am	384.5
Ti Kyit	Arrive Depart	12:25pm 1:49pm	391.5
Ta Te		2:22pm	404
Naung Tayar	Arrive Depart	2:51pm 3:02pm	410.5
Saung His		3:45pm	418
Pinlaung	Arrive Depart	4:16pm 4:32pm	424.5
Wa Lee		4:55pm	428.5
Pin Hkun		5:17pm	430.75
Nan Hta		5:23pm	
Hsaung Pyaung	Arrive Depart	5:56pm 6:05pm	439.75
Me Za Lan		7:04pm	448.25
Ka The		7:23pm	453
Pe Kon		7:39pm	455.75
Wi The Ku		8:43pm	470
Loikaw	Arrive	9:52pm	478

Table 51: The actual times for the trip from Aungban to Loikaw.

The First Class fare for tourists to Loikaw was only US$6, with individual tickets being written out showing the passenger's full name and passport number,

as was the norm at the time for foreign tourists in Burma. My ticket is shown in Plate 91.

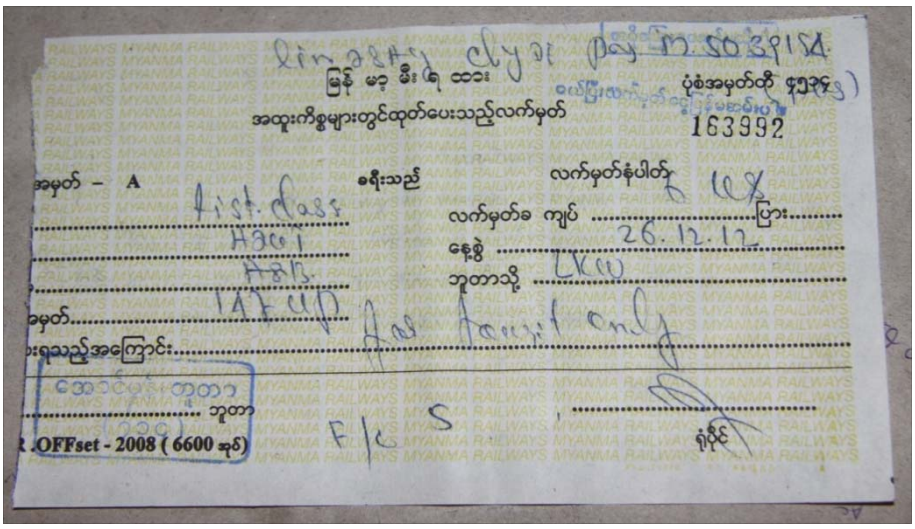

Plate 91: My ticket from Aungban to Loikaw.

The train number was the No. 147 Up service which had started from Pyinmana, near Nay Pyi Taw. There is desire by Myanma Railways to have Nay Pyi Taw as a central terminus for many trains, and this is an example. An article in *The New Light of Myanmar* in 2011 summed up this plan as follows:[8]

> *In the near future, the Railway Network can be created in Nay Pyi Taw at the centre to link all the railroads from the east to the west and from the north to the south of the nation.*

There is now also a direct link between Pyinmana and Shwe Nyaung, whereas before one had to travel on the main line to Thazi and then on the branch line to Shwe Nyaung (via Kalaw and Aungban). The train from Pyinmana was hauled by locomotive DF.2026, a more modern locomotive than the one that hauled it to Loikaw, which was DF.1611. The train arriving from Pyinmana is shown in Plate 92.

[8] *The New Light of Myanmar*, (2011, March 21), *op. cit.*

Plate 92: The train arriving from Pyinmana, hauled by locomotive DF.2026.

The carriage directly behind the locomotive, an Upper Class carriage, was detached at Aungban.

The train to Loikaw consisted of one First Class carriage, two Ordinary Class carriages and two goods vans, hauled by an old locomotive, DF.1611, which was manufactured by the French company, Alsthom.[9] The train is shown in Plate 93.

[9] The locomotive is probably one of thirteen 1,600-horsepower locomotives acquired from Alsthom in France in 1979/80. See:

Far Eastern Economic Review, (1981), *op. cit*., p.118.

Plate 93: The train to Loikaw waiting at Aungban Station, hauled by locomotive DF.1611.

Both the carriages and locomotive were quite old compared to the type of carriages and locomotives used on the main line from Yangon to Mandalay. The Ordinary Class carriages are shown in Plate 94. The first of these two carriages looked far from comfortable.[10]

Plate 94: The two Ordinary Class carriages on the train to Loikaw.

Rastorfer described the scenery south of Aungban as follows:[11]

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[10] Ordinary Class carriages have all wooden seats; seats in First Class have a wooden back but a soft seat; seats in Upper Class have soft seats and soft backs.

[11] Rastorfer, (1992), *op. cit.*

The scenery was beautiful, as were the color of the hills, the fields and the scanty forests.

Such scenery can be seen in the photographs in Plates 95 and 96 that were taken near Inn Wun (8 miles south of Aungban) and Mung Tang (about 22 miles south of Aungban).

Plate 95: Undulating countryside near Inn Wun, eight miles south of Aungban.

Plate 96: Rural scenery near Mung Tang, about 22 miles south of Aungban.

Rastorfer did not travel to Pinlaung, about 50 miles south of Aungban. A photograph taken at Pinlaung Station is shown in Plate 97.

Plate 97: Pinlaung Station.

The track is heavily overgrown with weeds, and one of the Ordinary Class carriages has been detached from the train.

6.3.1 Few Signs of Industrial Activity

During the trip to Loikaw, there was little sign of industrial activity. The community the railway line serves is nearly entirely rural. The one exception is a plant south of Mung Tang, shown in Plate 98, which appears to be a cement plant.[12]

Plate 98: A cement plant, south of Mung Tang.

[12] This is probably the plant operated by Dragon Cement, with an annual capacity of 180,000 tonnes of cement, which is listed in Table 46 in Chapter 5.

6.3.2 The Wayside Stations and the Condition of the Track

The first major stop was at Ti Kyit at 12:25pm, two hours south of Aungban. The train stopped there to wait for the northbound train, which arrived at 1:45pm. My train for Loikaw departed at 1:49pm. The line to Loikaw is only single track, with passing possible at certain stations. There is one passenger train in each direction each day. On my return trip the two trains crossed at Naung Tayar which is further south than Ti Kyit. A major problem is trains not running to time: my southbound train had left Aungban one hour late (it was scheduled to leave at 9:30am but was one hour late arriving from Pyinmana); my Loikaw-Aungban train on 28th December lost one hour when the locomotive broke down at Wa Lee, half way between Loikaw and Aungban. Unreliability such as this leads to long delays as one train waits for the other to pass.

The station at Ti Kyit was indicative of the overall state of the line. Plate 99 shows the main section of Ti Kyit Station, with people waiting in the foreground to load agricultural produce into the freight vans on the Loikaw-bound train, and in the distance at the other end of the platform people waiting to load produce onto the Aungban-bound train when it eventually arrived.

Plate 99: Ti Kyit Station.

As with all the stops we made, the goods being loaded were agricultural produce, in this case mostly bags of carrots, as shown in Plate 100.

Plate 100: Bags of carrots and other vegetables at Ti Kyit Station.

The train was a mixed passenger/goods train, which made it a very slow trip for the passengers, as typical stops took about fifteen minutes to load agricultural produce into the freight vans. However, servicing the interests of agriculture is included in the charter of Myanma Railways, as noted in a report by the International Bank for Reconstruction and Development, a predecessor of the World Bank, in 1956:[13]

> *The Board is required to operate the Railway on "business principles with due regard to the interests of agriculture, industry, commerce, and the general public."*

With this in mind, it is clear that this rural railway is providing a valuable service to the agriculture sector, by providing a low-cost means of transporting agricultural produce to market.

Ti Kyit was also revealing in that it illustrates the poor condition of the track: minimal ballast; and the track overgrown by weeds, as shown in Plate 101, though not as heavily overgrown with weeds as the track was at Pinlaung Station (see Plate 97 above).

[13] *International Bank for Reconstruction and Development*, (1956, April 27), *op. cit*., p.2.

Plate 101: Ti Kyit Station, showing the poor condition of the track.

The platform itself only has concrete for a few metres, as shown in Plate 99 above. The rest is dirt, as can be seen in the photograph in Plate 101 above. A more graphic example is shown in Plate 102, which shows one section of the station at Naung Tayar, another major stop further south from Ti Kyit. The track is overgrown with weeds, and the platform is in very poor condition. The poor state of the track is quite evident.

Plate 102: A section of Naung Tayar Station.

What these examples are illustrating is that when the line was built in 1992, much longer trains were probably anticipated as indicated by the long platforms that are now in poor condition. The long trains have not eventuated. Secondly, there is a

clear lack of maintenance on the track itself. The poor quality track; the lengthy stops for loading freight; not running to time causing major delays in passing: all these add up to a very inefficient system on rural lines such as this one.

The condition of the track was one of the key things observed on this trip. A typical photograph of the condition of the track is shown in Plate 102 above, and also in Plate 103 which shows the track at Wa Lee. The line shown is not some siding, or small line leading to a depot: it is the main line north to Aungban. Track maintenance on this line is very poor.

Plate 103: The track at Wa Lee is badly overgrown by weeds.

An equally startling example of poor track condition is shown in Plate 104.

Plate 104: Undergrowth right up against the carriages of the train.

This photograph was taken on the return trip, about 25 miles north of Loikaw. The undergrowth was pushing up against the sides of the carriage.

The quality of construction is a key issue in the efficiency of the track. Commenting in 1992 from the perspective of a civil engineer who specialised in railway engineering, Rastorfer described the quality of construction as follows.[14]

> *Of course such simple construction is only suitable for very low speed of light trains. ..... The short time allowed for the construction and the lack of capital is also responsible for these techniques.*

Unfortunately such issues still apply today, and this was quite evident when I travelled in 2013 on a recently built line on the west bank of the Irrawaddy River, between Pakokku and Kyangin, as discussed in Chapter 5 of this thesis. The quality of the rolling stock is also a concern. On the return trip the locomotive broke down at Wa Lee with an electrical problem, and it was one hour before we were underway again.

Plate 105: The locomotive broken down at Wa Lee on the return trip.

The locomotive, DF.2004, is a 2,000-horsepower locomotive and was manufactured in 1978 by Alsthom, a French company.[15]

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[14] Rastorfer, (1992), *op. cit.*

[15] The information on the age of the locomotive was supplied by the railway engineer on the train. This locomotive is still in use. It was hauling a passenger train at Ye in January 2018, and I was a passenger on a train it hauled from Ye to Dawei in January 2017.

6.3.3 A New Line from Nay Pyi Taw to Pinlaung

There may be increased traffic in the new future, as a new line is being constructed between Nay Pyi Taw and Pinlaung, which is half way between Aungban and Loikaw. Some photographs of the construction underway for this new line are shown in Plates 106 to 108 below.

Plate 106: The new railway being built between Pinlaung and Nay Pyi Taw.

Plate 107: A new block station being built on the Nay Pyi Taw to Pinlaung line.

Plate 108: An embankment being built for the new Nay Pyi Taw to Pinlaung line.

The new line, known as the Nay Pyi Taw-Takton-Pinlaung line, was one of thirteen new lines announced in October 2010, and will be 105 miles long.[16] Unlike other lines, such as the Hsipaw-Namsang line or the Shan State Railway starting at Kengtung, both of which have been started but abandoned, it appears as if this new line will be completed, possibly because it is relatively short and also because it comes from Nay Pyi Taw. This is another example of a line emphasising the government's plan to have Nay Pyi Taw's as the centre of the railway network.[17]

Another issue is derailments. In December 2011 I was travelling from Hsipaw to Lashio when the train derailed.[18] This is not an uncommon occurrence on Myanma Railways, but they take derailments in their stride. In the one between Hsipaw and Lashio, the train was jacked up, back on the track and underway in just 55 minutes. For the Aungban to Loikaw trip I noticed jacks at the end of my carriage, ready in case there was a derailment. Interestingly, one of the passengers on the Aungban-Loikaw trip, a very strong railway employee, was the key man in jacking up the train in the derailment between Hsipaw and Lashio. It is possible that his job may be to ride on the trains in order to be ready for events such as derailments.

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[16] Moe Myint Lin Let, (2010, October 30), *op. cit*.

[17] *The New Light of Myanmar*, (2011, March 21), *op. cit*.

[18] Stubbs, (2012, April 21), *op. cit*.

6.4 The Railhead at Loikaw

The station at Loikaw is modern and functional, and is shown in Plates 109 and 110.

Plate 109: Loikaw Railway Station.

Plate 110: At Loikaw Railway Station.

The Station Master at Loikaw said that I was the first foreign passenger in twenty years to travel by train to Loikaw. The reason for this is that Kayah State at the time was a restricted area, and foreign tourists needed permission from a Minister of State to travel there. This can be organised by travel agents in Yangon who

then take tourists there by road or air, certainly not by train via Aungban.[19] The line is scenic, if rather slow, and by having this policy the region is missing out on some potential foreign tourist traffic.

6.5 Conclusion

The line between Aungban and Loikaw is a typical rural line in Burma. The trip is scenic but slow; there are lengthy stops at the wayside stations; and the track is in need of much greater maintenance. The line's main functions are the support of the agricultural sector and the provision of transport between towns and villages for the local people. An improved track and better rolling stock would see the line playing a much more important role in supporting the agricultural-based economy of the region. The railway capacity could also be improved by having additional double-track sections at more stations to enable trains travelling in the opposite direction to pass.[20]

The line does serve a valuable role, in servicing the rural community, but it does appear to be underutilised with just one train in each direction per day. The eventual completion of the Nay Pyi Taw-Takton-Pinlaung line will see more southbound traffic between Pinlaung and Loikaw and also possibly more northbound traffic between Pinlaung and Aungban.

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[19] The police and immigration officials informed me of the Restricted Zone status on my arrival, and ordered me to leave the following day. I stayed one day however, and did see about four foreign tourists in the city.

[20] The term "railway capacity" is a technical term that refers to the number of trains that could run over a route in a 24-hour period. Distinction is made between the theoretical capacity, the practical capacity, the used capacity and the available capacity. In this line's case, the used capacity appears to be one train per day in each direction. A definition of these terms can be found at:

Ricci, Stefano and Evangelia Kontaxi, (2009), "Techniques and methodologies for railway capacity analysis: comparative studies and integration perspectives". A presentation at the 3rd International Seminar on Railway Operations Modelling and Analysis, Zurich, 2009. Retrieved from: https://sites.google.com/site/railwaycapacitycalculator/home; and

Quorum Corporation, "Railway Capacity Background & Overview". Retrieved from: http://www.quorumcorp.net/Downloads/Papers/RailwayCapacityOverview.pdf.

Chapter 7

RAILWAYS IN SHAN STATE

7.1 Introduction

Shan State is the largest by area of the fourteen regions and states in Burma, with an area of just over 60,000 square miles, which is approximately one quarter of the total area of Burma, and has a population of 5.8 million people, placing it as the fifth largest region or state in terms of population.[1] Shan State has borders with China, Laos and Thailand, as shown in Map 21.[2]

Map 21: Shan State.

The state capital is Taunggyi, with Kengtung, Tachileik and Lashio being the other major towns. Shan State is predominantly a rural state.

From a railway perspective, there are two major lines. The first, built by the British, is a branch line from Mandalay. A very scenic line, it goes from Mandalay to Pyin Oo Lwin (in Mandalay Region) before crossing into Shan State with major

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[1] Oh, Su-Ann, (2016), "Making Sense of the Election Results in Myanmar's Rakhine and Shan States", Trends in Southeast Asia, 2016, No. 1, ISEAS Yusof Ishak Institute, Singapore, p.12.

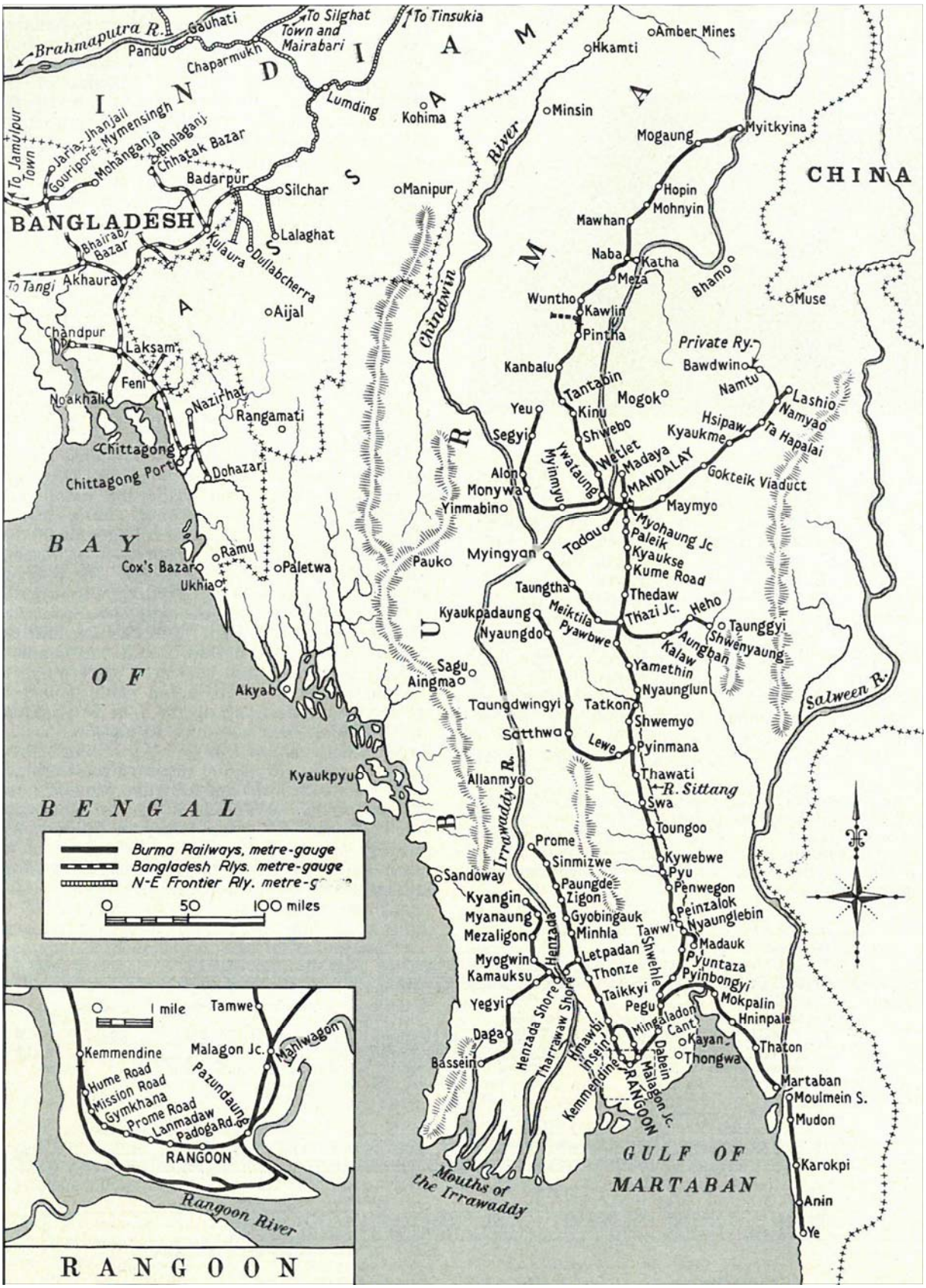
[2] This map is sourced from:

Little Voice in English website: http://littlevoiceenglish.blogspot.com.au/p/shan-state.html.

stations being Kyaukme, Hsipaw and Lashio where the railhead is. Before reaching Kyaukme the line crosses the famous Gokteik Viaduct. This line can be seen in Map 22 on the next page, with Pyin Oo Lwin being shown by its former name, Maymyo.[3]

[3] Map 22 is sourced from:

Ballantyne, Hugh, (1977, February), "On the Road to Mandalay", The Railway Magazine, Volume 123, No. 910, pp.64-69.



Map 22: The Burma Railways network in 1977.

This map also shows the Burma Mines Railway, which is a narrow-gauge line going from Namyao (near Lashio) to Namtu and the Bawdwin Mines.[4] The China-Burma Railway, the subject of Chapter 4 of this thesis, will follow a similar route to the Lashio-Mandalay line through Shan State if it is ever built.

It is the second major line in Shan State that is the focus of this chapter. The line starts at Thazi on the main Yangon-Mandalay line. Thazi is in Mandalay Region. There are only two passenger trains per day from Thazi on this line.[5] One train goes to Shwe Nyaung and Yaksauk, the other to Aungban before heading south to Loikaw in Kayah State. The line which goes from Thazi to Shwe Nyaung was also built by the British, and is very scenic with two switchbacks or zigzags, and a single loop or spiral railway at Heho.[6] The line is popular with tourists travelling to Inle Lake, near Shwe Nyaung. The first major station in Shan State is the former British hill station, Kalaw, which is a popular tourist destination and is also the location of a major military base. The next major stop is Aungban (the junction for the line to Loikaw in Kayah State, as discussed in Chapter 6). The line passes through Heho before reaching Shwe Nyaung, which is an important station because of its proximity to Inle Lake. There is a quite substantial station at Shwe Nyaung, as can be seen in Plate 111 below.

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[4] Ballantyne, (1977, February), *op. cit.*; and

Ballantyne, (2000, January), *op. cit.*; and

The International Steam Pages, "The Burma Mines Railway, February 2006", *op. cit.;* and

Whitehouse, (2014, June/July), *op. cit.*

The gauge of the Namyao-Bawdwin line is 2 feet (610mm). There have been two other narrow-gauge railways in Burma: the Arakan Light Railway (discussed in Chapter 5) and the Madaya Light Railway near Mandalay. Both lines were 2 *ft* 6 *in* gauge. The Madaya Light Railway went from Mandalay to Madaya (north of Mandalay) via Taungbyon (also spelt as "Toungbyon"). It opened in 1917 but was closed in 1927, being replaced by a metre-gauge line. See:

Hughes, Hugh, (1994), "Indian Locomotives. Part 3 – Narrow Gauge Lines 1863-1940", The Continental Railway Circle, Middlesex, p. 14, pp.28-29 and p.49; and

Ford, Jan, (2015, June 25), "The Madaya Light Railway", *Jan Ford's World* website. Retrieved from: http://janfordsworld.blogspot.com.au/2015/08/the-arakan-light-railway.html.

[5] The No. 141 Up train departs from Thazi at 7:00am, arriving at Shwe Nyaung at 5:00pm. It waits there for an hour before departing for Yaksauk, arriving there at 9:30pm. There used to be two trains per day from Thazi, with the main one (the No. 143 Up service) departing from Thazi at 5:00am and arriving at Shwe Nyaung at 3:20pm and Yaksauk at 7:00pm, but this service was cancelled in 2016.

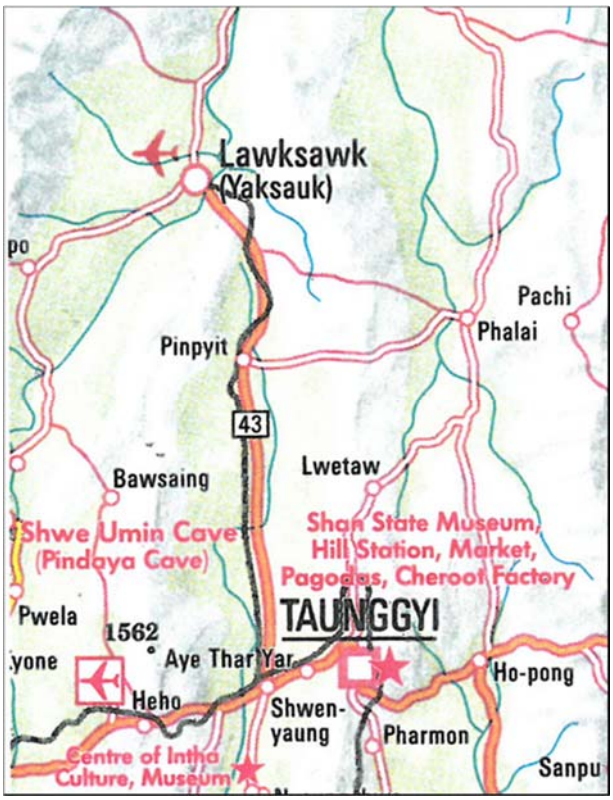
[6] A single loop is where a line loops back under itself. Good examples can be seen on the Kalka Simla Railway and the Darjeeling Himalayan Railway in India.

Plate 111: Shwe Nyaung Railway Station.

But the line does not stop there, turning north to Yaksauk (also known as Lawksawk). The line to Yaksauk is shown in Map 23 below.[7]

[7] Map 22 above shows the line from Thazi to Shwe Nyaung but not the line extending to Yaksauk. The map in Map 23 is sourced from the latest Nelles map. See:

Nelles Verlag, (2016), *op. cit*.



Map 23: The line from Shwe Nyaung to Yaksauk.

In the 1990's Burma Railways (under the control of the military junta) built a line from Shwe Nyaung to Yaksauk and another from Shwe Nyaung to the state capital Taunggyi. The line to Taunggyi can be seen in Map 24 below.[8]

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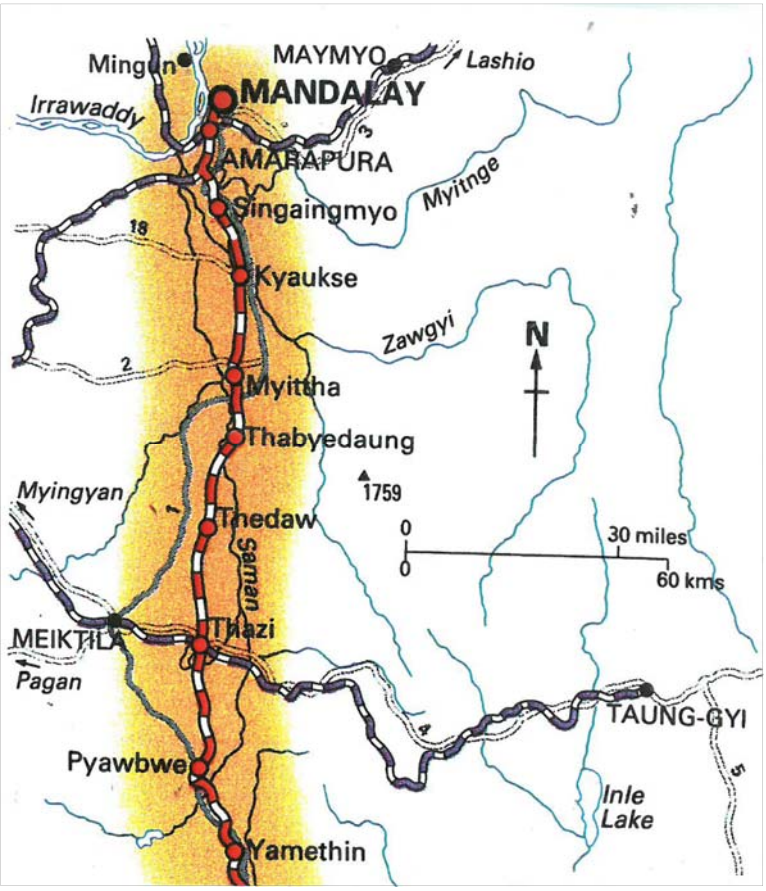
[8] Davies, Ben (1993), "Taking the Mandalay Express from Yangon", in Gordon, Susan (ed.), (1993), "Train Journeys of the World", The Automobile Club, Hampshire, United Kingdom, pp.88-95.

In 1993 the line was still in the construction phase, as it was not completed until late 1997. Nevertheless it was appearing on maps such as this one. Similarly the line from Shwe Nyaung to Taunggyi is also shown in the map of Burma published by Nelles *circa* 1989. This map does not show the line from Shwe Nyaung to Yaksauk nor from Taunggyi to Mong Nai, which is consistent with their not having been built until the 1990's. A 2004 edition of the Nelles map shows the line from Shwe Nyaung to Yaksauk and from Taunggyi to Mong Nai, but the line between Shwe Nyaung and Taunggyi is no longer shown, suggesting it may have been out of use by 2004. However, Myanma Railways' staff have told me that the Shwe Nyaung to Taunggyi line was used up until 2012. See:

Nelles Verlag, (*circa* 1989), "Map of Burma (Myanmar)", ISBN 3-88618-600-8; and

Nelles Verlag, (2004), "Map of Myanmar (Burma)", ISBN 3-88618-549-4.



Map 24: A map from 1993 showing the Thazi to Taunggyi line.

The line from Shwe Nyaung to Taunggyi is no longer operational, which is surprising given that Taunggyi is the capital of Shan State. At Taunggyi there is a large station with a line running from Taunggyi to Kakku and Htiyi, with an unusable section of line heading north-east from Htiyi to Namsang before turning south to Mong Nai. A new railway, known as the Shan State Railway, was planned to be built by the former military government between Kengtung and Mong Nai. Construction started in 2010 but was quickly abandoned.

The purpose of this chapter is to focus on these four lines in the southern part of Shan State:

- The Thazi to Shwe Nyaung to Yaksauk line (focusing mainly on the Shwe Nyaung to Yaksauk line).
- The Shwe Nyaung to Taunggyi line (no longer in use).
- The Taunggyi to Kakku to Mong Nai line (only used for a part of its length).
- The Shan State Railway from Kengtung to Mong Nai (construction abandoned).

7.2 The Line from Thazi to Yaksauk, via Shwe Nyaung

The line from Thazi to Shwe Nyaung was built by the British, with the line from Thazi to Kalaw (63 miles) being opened in 1915, and extended to Heho (87 miles from Thazi) in 1921.[9] There were plans in the 1920's and 1930's to extend the line from Heho through Shwe Nyaung northwards to Hsipaw on the branch line from Mandalay to Lashio, but this never eventuated.[10] This line can be seen in Map 25 below, and is marked with a red arrow.[11]

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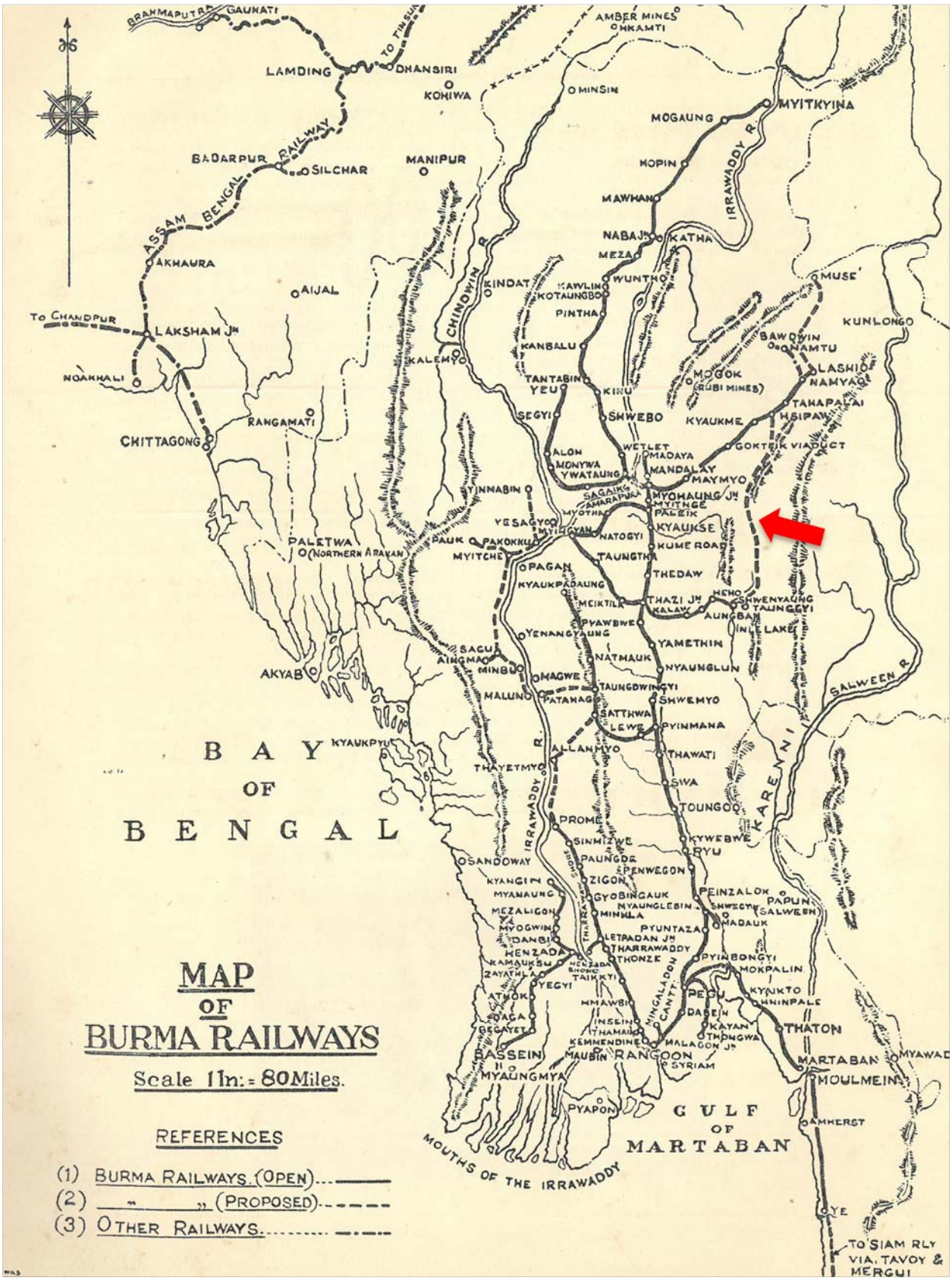
[9] *Burma Railways*, (1927, October), "Burma Railways Time Table", British Burma Press, Rangoon, October 1927, p.19. *(A copy of this timetable is in my possession)*; and

Burma Railways, (1935, October), "Burma Railways Time Table, Jubilee Edition", The Burma Art Press, Ltd., Rangoon, p.vii. (*A copy of this timetable is in my possession*).

[10] *Ibid.* This planned extension can be seen on the map in the 1927 timetable as well as in the 1935 timetable.

[11] *Burma Railways*, (1935, October), *op. cit.,* p.vi.



Map 25: A map from 1935 showing the planned line from Shwe Nyaung to Hsipaw.

This line was proposed again in 2009 (the Hsipaw-Laihka-Namsang Railway), with construction starting at the Hsipaw end but being quickly abandoned.[12] The trip from Thazi to Shwe Nyaung takes ten hours, with the No. 141 Up service departing from Thazi at 7:00am with a scheduled arrival at Shwe Nyaung at 5:00pm.[13] The distance by rail from Thazi to Shwe Nyaung is 98 miles, so this is an average speed of just under 10 miles per hour.[14] The train waits for one hour at Shwe Nyaung before departing at 6:00pm, with a scheduled arrival at Yaksauk at 9:30pm.

I travelled to from Shwe Nyaung to Yaksauk by train in February 2016 when the trains were running on the former timetable.[15] The train departed five minutes late at 3:25pm from Shwe Nyaung, but arrived forty minutes early at Yaksauk at 6:20pm. The line is a single track with a few small stations along the way. There is a quite substantial station at Yaksauk, as can be seen in Plate 112 below.[16]

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[12] Stubbs, (2012, November 26), *op. cit.*

[13] The journey is quite slow. In 1927, the trip by steam train left Thazi at 8:40am, arriving at Shwe Nyaung at 6:45pm, a trip of ten hours and five minutes. Ninety years later, the trip still takes ten hours. See

Burma Railways, (1927, October), *op. cit*. p.71.

[14] Thazi is 306 miles from Yangon by rail; Shwe Nyaung 404 miles, so the distance between the two is 98 miles. Yaksauk is 441.5 miles by rail from Yangon, and therefore 135.5 miles from Thazi.

[15] Under the former timetable, the No. 143 Up service departed Thazi at 5:00am, arriving at Shwe Nyaung at 2:50pm. It waited there for 30 minutes before departing for Yaksauk at 3:20pm, with a scheduled arrival at Yaksauk at 7:00pm.

[16] This photograph was taken at 6:26pm, just 6 minutes after the train had arrived. As can be seen, the platform is deserted. Not a lot of passengers had travelled the full distance to Yaksauk.

Plate 112: The station at Yaksauk.

I was told that the line is kept open to provide transport for the Defence Services Academy in Yaksauk. There were quite a number of soldiers at Yaksauk Station when I arrived at 6:20pm, and they appeared to be preparing to sleep on the train overnight when it was parked at the station.

The line from Shwe Nyaung to Yaksauk was built by Myanma Railways when the military junta was running the country. It is functional, suitable for the two passenger trains a day and goods trains to Yaksauk. An important commodity transported by rail to Yaksauk is petrol. The stations are quite basic, and are similar to the ones on the line from Aungban to Loikaw, a line that was also built in the 1990's. One quite substantial station on the line is Pin Hpyit Station, which is shown in Plate 113 below.[17]

[17] "Pin Hpyit" can also be spelt as "Pinpyit", as shown in Map 23.

Plate 113: A well-built station at Pin Hpyit on the Shwe Nyaung to Yaksauk line.

The other stations on the line are of lesser quality, such as at Taung Ni, which is shown in Plates 114 and 115 below.[18]

Plate 114: A sub-standard station at Taung Ni on the Shwe Nyaung to Yaksauk line.

[18] The neglected state of Taung Ni station can be seen from the condition of the station sign in Plate 115. The sign is in danger of falling over.

Plate 115: The station sign at Taung Ni Station.

A similar poor quality station is at Yadanar Pon, shown in Plates 116 and 117 below.

Plate 116: The station building at Yadanar Pon on the Shwe Nyaung to Yaksauk line.

Plate 117: The platform at Yadanar Pon Station.

The station building at Yadanar Pon is quite rudimentary, and the platform itself is just bare earth like many stations in Burma.

The line services the local rural community by way of the ten stations on the line between Shwe Nyaung and Yaksauk, and services the Defence Services Academy in Yaksauk. There is only one passenger service each way per day between Shwe Nyaung and Yaksauk, and the occasional goods train taking freight to Yaksauk, probably petrol and other fuel, and military supplies. Plate 118 shows a goods train with three fuel tankers at Shwe Nyaung, waiting to depart for Yaksauk.

Plate 118: A goods train at Shwe Nyaung, waiting to depart for Yaksauk.

The goods train shown in Plate 118 is typical of goods trains in Burma, as is the one shown in Plate 27 in Chapter 3. They are quite short unlike the very long goods trains in operation in more developed countries. But given the nature of the branch lines such as the Mandalay-Lashio line and the Thazi-Yaksauk line, where the terrain is hilly and the lines are quite winding as well as employing switchbacks, short goods trains are no doubt appropriate.

The land between Shwe Nyaung and Yaksauk appeared to be very fertile with many orchards, and other crops such as sunflowers and onions. The train I was travelling on was a mixed passenger/goods train, which is common in the rural areas (e.g. see the discussion of the Aungban to Loikaw line in Chapter 6). Agricultural produce is probably the most common type of goods transported on these trains.

7.3 The Abandoned Line from Shwe Nyaung to Taunggyi

A line was built from Shwe Nyaung to Taunggyi in the 1990's, being opened in December 1997.[19] The government reported at the time that the line was built solely by Tatmadaw soldiers who experienced many difficulties because of the

[19] *The New Light of Myanmar*, (1997, December 26), "Taunggyi-Shwenyaung Railroad section will usher in a new era. Entire work through harsh terrain undertaken solely by Tatmadawmen". Retrieved from: http://www.burmalibrary.org/docs6/NLM1997-12-26-text.pdf.

harsh terrain.[20] During construction there were regular inspections by senior members of the military junta.[21] Hettler commented in 2013 that this line was so steep and curved that the trains were very slow and was only being used for freight, and that rail passengers were travelling between Shwe Nyaung and Taunggyi by bus.[22] The line was 20.5 miles in length, and there were four stations between Shwe Nyaung and Taunggyi, as shown in Table 52.[23]

Station	Distance from Yangon (Miles)	Distance from Shwe Nyaung (Miles)
Shwe Nyaung	404.0	-
Aye Tha Ya	408.8	4.8
Paw Mu	413.5	9.5
Hti Thin		
Ye Twe-U		
Taunggyi	424.5	20.5

Table 52: The stations between Shwe Nyaung and Taunggyi

The gradient from Shwe Nyaung to Taunggyi is steep, with a gradient of 1:40 between Shwe Nyaung and Paw Mu, but 1:18 between Paw Mu and Taunggyi.[24] The gradient of 1:18 is too steep for the trains. Shwe Nyaung's elevation is 2,934 feet above sea level, whereas Taunggyi's is 4,712 feet above sea level.

The line starting from Shwe Nyaung and heading in Taunggyi's direction as well as the line from Taunggyi heading towards Shwe Nyaung are both clearly visible. On 12th February 2016 I followed the line from Taunggyi Station as far as I could, for about 40 minutes on foot. Leaving Taunggyi Station the line was quite good, as can be seen in Plate 119 below.

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[20] *Ibid.*

[21] *The New Light of Myanmar*, (1997, May 2), "General Maung Aye, Secretary-2 inspect building of railroad, discovery of mineral deposits in Thaunggyi, extraction of gypsum in Maukmai". Retrieved from: http://www.burmalibrary.org/docs6/NLM1997-05-02-text.pdf; and

The New Light of Myanmar, (1997, August 20), "General Maung Aye, inspects building of Taunggyi Shwenyaung Railroad". Retrieved from: http://www.burmalibrary.org/docs6/NLM1997-08-20-text.pdf; and

The New Light of Myanmar, (1997, September 8), "Taunggyi-Shwenyaung Railroad inspected". Retrieved from: http://www.burmalibrary.org/docs6/NLM1997-09-08-text.pdf.

[22] Hettler, (2013, August), *op. cit.*

Having seen this abandoned line, I would be very surprised if it was still operating in 2013.

[23] *Wikipedia* website, "List of railway stations in Myanmar", *op. cit*.

[24] Personal communication from the Station Master at Taunggyi in February 2016.

Plate 119: The start of the line from Taunggyi to Shwe Nyaung.

The line was in reasonably good condition until shortly after crossing the main road that goes to Kengtung, as can be seen in Plate 120.

Plate 120: The Taunggyi to Shwe Nyaung line, shortly after crossing the main road.

But then the line quickly deteriorated, so badly that it was unfit for a train to run on, as can be seen in Plate 121 below.

Plate 121: The Taunggyi to Shwe Nyaung line, unserviceable.

Finally, the track was totally overgrown by weeds as shown in Plate 122 below, with the track just visible in the foreground of this photograph. The rail line is indicated by the red arrow.

Plate 122: The Taunggyi to Shwe Nyaung track, overgrown by weeds.

The last clear evidence of the track was a milepost, which is shown in Plate 123 below. It had the number "424" written on the top in Burmese script, indicating it is 424 miles by rail from Yangon. This places it 20 miles from Shwe Nyaung Station and half a mile from Taunggyi Station.[25]

Plate 123: A milepost on the Taunggyi to Shwe Nyaung line.

I returned to this line a year later, and at Shwe Nyaung located the start of the track that used to go from there to Taunggyi. On 28th January 2017 I followed the track on foot for about two and a half hours. The line leaves Shwe Nyaung Station by passing to the right of the locomotive shed, and is immediately overgrown by bushes and weeds, as is shown in Plate 124 below.

[25] Shwe Nyaung Station is 404 miles from Yangon Central Railway Station; Taunggyi Station is 424.5 miles from Yangon Central Railway Station. See

Wikipedia website, "List of railway stations in Myanmar", *op. cit.*

I had walked for 40 minutes, so I am surprised that this signpost is supposedly only half a mile from Taunggyi Station.

Plate 124: The Shwe Nyaung to Taunggyi line, shortly after leaving Shwe Nyaung.

I was surprised at how bad the state of the line was so close to Shwe Nyaung Station, for at the other end at Taunggyi Station it was in reasonably good condition near the station. After about half a mile the line crosses the Shwe Nyaung to Yaksauk road, and heads into an army base, as shown in Plate 125 below.

Plate 125: The line crossing the Shwe Nyaung to Yaksauk road, before heading into an army base.

Gates going into the army base can be seen in the background in Plate 125 and are shown in e detail in Plate 126 below. By now the track was in very poor condition.

Plate 126: The gates where the Shwe Nyaung to Taunggyi line heads into the army base.

I skirted around the army base via a reservoir and rejoined the line on the other side of the army land. As I continued following the track, I saw a number of abandoned concrete sleepers lying on the side of the line, as can be seen in Plate 127.

Plate 127: Abandoned concrete sleepers next to the Shwe Nyaung to Taunggyi line.

There had clearly been plans to improve the line by replacing wooden sleepers with concrete ones, but this plan was abandoned and the line was closed.

The line was on flat ground adjacent to rice paddies and was heavily overgrown with bushes and weeds, as can be seen in Plate 127 above and Plate 128 below.

Plate 128: The Shwe Nyaung to Taunggyi line, badly overgrown by bushes and weeds.

The rail line is indicated by the red arrow in Plate 128. The line was passing through flat agricultural land, and I had not reached the first railway station (Aye Tha Ya Station) by the time I turned back, returning to Shwe Nyaung via the army base.

At Shwe Nyaung Station I met a Divisional Traffic Manager from Myanma Railways who was there for an inspection. He said that the line from Shwe Nyaung to Taunggyi had closed in 2012, and there was no money to rebuild it. What was troubling was that he simply pointed to the road (about 500 metres away) and said "*there is a good road to Taunggyi*". He also said there were insufficient passengers for the line. To me this reflects a short-sighted attitude of not wishing to do anything for these sort of rural lines. A rail line from Shwe Nyaung to Taunggyi would:

- Link the state capital of Shan State (Taunggyi) to the rest of the Myanma Railways network.
- Allow goods trains coming from Thazi to continue on to Taunggyi.
- Provide a passenger service. People who not have their own transport need to travel by pick-up from Shwe Nyaung to Taunggyi.
- Provide a link to the Shan State Railway (from Taunggyi to Kengtung) if it is ever built.

A comparison can be made to Australia, where over the last twenty years a number of rural lines have been closed as they were deemed to be uncommercial. A good example is the line from Blayney to Demondrille in south-western New South Wales.[26] This line passes through the important regional centres of Young and Cowra and joins the main Sydney-Melbourne line at Harden (near Demondrille). The line was progressively closed between 2007 and 2009. It provided a valuable service, especially for the transport of wheat. Much of the track is now grassed over or washed away, but there are moves afoot to re-open

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[26] *Railway Gazette*, (2013, September 11), "Private-sector reopening proposed". Retrieved from: http://www.railwaygazette.com/news/single-view/view/private-sector-reopening-proposed.html*; and*

Railway Gazette, (2015, May 13), "Cowra Lines tender fails to find private operator". Retrieved from: http://www.railwaygazette.com/news/freight/single-view/view/cowra-lines-tender-fails-to-find-private-operator.html; and

Thistleton, John, (2016, August 13), "Harden, Young, Cowra, Blayney railway branch line to re-open for grain", The Canberra Times. Retrieved from: http://www.canberratimes.com.au/act-news/harden-young-cowra-blayney-railway-branch-line-to-reopen-for-grain-20160809-gqof6u.html; and

Coote, Gavin, (2017, April 13), "Linking west with south: investigations begin into re-opening dormant NSW line", ABC News. Retrieved from: http://www.abc.net.au/news/2017-04-13/linking-west-with-south-investigations-begin-into-reopening-rail/8442234.

the line for freight transport, as it is considered to be the "missing link" between the state's south and west. Similarly, the line from Shwe Nyaung to Taunggyi line is in a bad condition, overgrown by bushes and weeds. But if re-opened it will provide a valuable link to the state capital, Taunggyi, for both passengers and freight, and will also be the "missing link" when a railway is eventually built from Kengtung to Taunggyi.

The line between Shwe Nyaung and Taunggyi described above was built under the military junta's regime, and clearly has deteriorated badly since being taken out of service in 2012.[27] This line runs to the east of Taunggyi, but it was suggested to me that a better route lay to the south-west of Taunggyi, as it is not as steep.[28] Taunggyi is the capital of Shan State, and has a population of about 265,000 people.[29] The National League for Democracy Party received about 40% of the vote in Shan State in the national election in November 2015, well below its national average.[30] The new government could create much political goodwill for itself by making it a priority to construct a rail link between Taunggyi and Shwe Nyaung, following either the current alignment or a new one, in order to link Taunggyi with the main Myanma Railways network. There will be challenges because of the steepness of the terrain, but with help from international partners it should be possible to construct this line of approximately 21 miles.

7.4 The Line from Taunggyi to Mong Nai

The line from Taunggyi to Mong Nai has many similarities with the line from Kalaymyo discussed in Chapter 5: both are isolated from the rest of the Myanma Railways network, but should not be. The line was constructed in the late 1990's

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[27] I visited Shwe Nyaung Station on 28th and 31st January 2017 and was advised by the Station Master and a Divisional Traffic Manager visiting the station for an inspection that the Shwe Nyaung to Taunggyi line had last been used in 2012.

[28] The suggestion of the route to the south-west of Taunggyi came from a long-term resident of Taunggyi who is not an employee of Myanma Railways.

[29] *Department of Population, Ministry of Immigration and Population*, (2015, May), *op. cit.*, p.62.

[30] The Shan and Rakhine State assemblies were the only regional assemblies where the National League for Democracy did not dominate the vote in the 2015 election. Of the available seats in the Shan State Assembly, the Union Solidarity and Development Party (USDP) won 32.3% of the seats, the Shan Nationalities League for Democracy (SNLD) 24.7%, and the National League for Democracy (NLD) 21.7%, with smaller ethnic parties making up the rest. See

Oh, (2016), *op. cit.*, p.3 and p.11.

and early 2000's by Myanma Railways staff and Tatmadaw soldiers.[31] In 2001 an article in the government newspaper, *The New Light of Myanmar*, described the construction of the line as follows:[32]

> *The Tatmadawmen of the battalions of the No 55 LID are building the railroad under the supervision of the Eastern Command.*

Therein lies the problem that is evident today: the line from Shwe Nyaung to Taunggyi to Mong Nai was built by the military rather than railway engineers, and very little of the line is useable today. By contrast, the line from Thazi to Shwe Nyaung was built by the British who were very experienced in railway construction, and that line has stood the test of time.

The line from Shwe Nyaung to Mong Nai, described as the Shwenyaung-Taunggyi-Saikkhaung-Namhsan-Mongnai Railroad, was opened in January 2006 and was 197 miles long.[33] The lengths of the key segments of this line are shown in Table 53 below.[34]

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[31] *The New Light of Myanmar*, (2000, December 26), "Minister for Rail Transportation inspects Taunggyi-Banyin-Saikkhaung-Mogni-Namhsan railroad". Retrieved from: http://uzo.sakura.ne.jp/burma/nlm/nlm_data/nlm_2000/nlm_12_2000/N001226.htm; and

The New Light of Myanmar, (2001, March 29), "Minister inspects Shwenyaung-Taunggyi Rail Road". Retrieved from: http://uzo.sakura.ne.jp/burma/nlm/nlm_data/nlm_2001/nlm_03_2001/nlm_29_03_2001.htm; and

The New Light of Myanmar, (2001, July 2), "More railroads, roads being built in Shan State (South) for regional progress. General Maung Aye discusses transport and economy in Taunggyi". Retrieved from: http://uzo.sakura.ne.jp/burma/nlm/nlm_data/nlm_2001/nlm_07_2001/nlm_02_07_2001.htm; and

The New Light of Myanmar, (2001, October 25), "General Maung Aye inspects construction tasks for of Saikkhaung-Namsang railroad project". Retrieved from: http://uzo.sakura.ne.jp/burma/nlm/nlm_data/nlm_2001/nlm_10_2001/nlm_25_10_2001.htm; and

The New Light of Myanmar, (2002, May 14), "General Maung Aye inspects construction of Saikkhaung-Namsang railroad". Retrieved from: http://uzo.sakura.ne.jp/burma/nlm/nlm_data/nlm_2002/nlm_05_2002/nlm_14_05_2002#(1).

[32] *The New Light of Myanmar*, (2001, September 20), "103-mile Saikkhaung-Namhsan railroad scheduled to be completed in October next year". Retrieved from: http://uzo.sakura.ne.jp/burma/nlm/nlm_data/nlm_2001/nlm_09_2001/nlm_20_09_2001.htm.

"LID" stands for Light Infantry Division.

[33] *The New Light of Myanmar,* (2006, January 2), "Shwenyaung-Taunggyi-Saikkhaung-Namhsan-Mongnai Railroad innaugurated". Retrieved from: http://www.ibiblio.org/obl/docs2/NLM2006-01-02.pdf.

This is a lengthy article (four pages) describing the inauguration of the line by the then Prime Minister, General Soe Win.

[34] These distances are calculated from information given in:

The New Light of Myanmar, (2002, May 14), *op. cit*.; and

The New Light of Myanmar, (2006, January 2), *op. cit*.

Section of line	Length (Miles)
Shwe Nyaung - Taunggyi	20.5
Taunggyi - Saikkhaung	41.6
	62.1
Saikkhaung - Namsang	103.0
Namsang - Mong Nai	31.9
Total length of the line	**197.0**

Table 53: Distances on the Shwe Nyaung to Mong Nai line.

The line from Taunggyi to Mong Nai was built in four stages, as shown in Table 54 below.[35]

Railway Stage	Length (Miles)
Taunggyi - Banyin	35.25
Banyin - Saikkhaung	6.35
Saikkhaung - Ponchaung - Namsang	103.00
Namsang - Mong Nai	31.90
	176.50

Table 54: The stages of construction of the Taunggyi to Mong Nai line.

In 2006 the government estimated that there were 700,000 people of different national races living along this line in 1,360 villages.[36] The line, when it was fully operational, provided a valuable service to these villages.

The line from Taunggyi to Mong Nai is shown in Map 26 below, but only a part of the line is in use today.[37]

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[35] *The New Light of Myanmar*, (2001, July 2), *op. cit.*

The last stage built was the Saikkhaung-Ponchaung-Namsang line. The Saikkhaung-Ponchaung section was 48 miles long, and the Ponchaung-Namsang section was 55 miles long.

The distance from Taunggyi to Banyin is taken from:

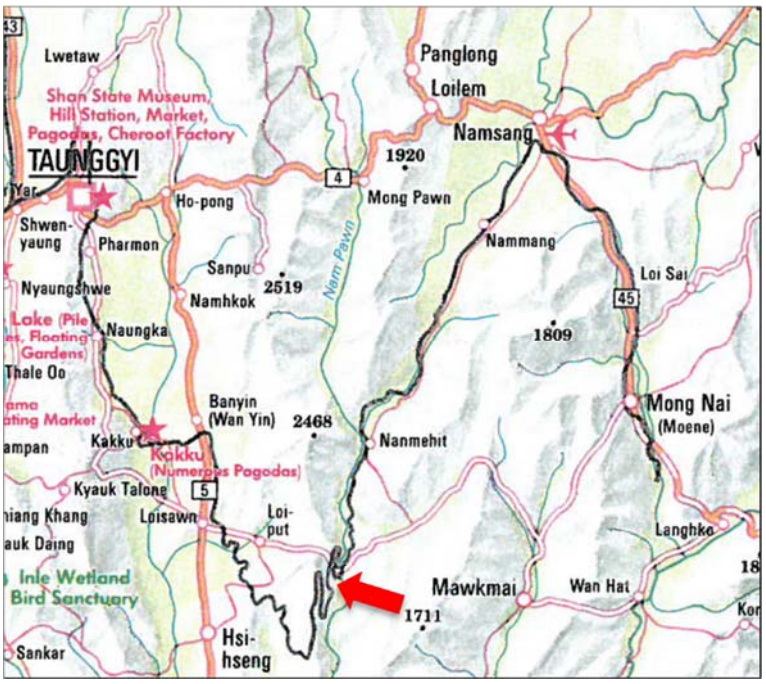
Wikipedia website, "List of railway stations in Myanmar", *op. cit.*

[36] *The New Light of Myanmar*, (2006, January 2), *op. cit*.

[37] This map is sourced from a 2016 edition of a Nelles Verlag map of Myanmar (ISBN 978-3-86574-503-3). It shows the line from Shwe Nyaung to Taunggyi, but as discussed above this line was abandoned in 2012. It also shows a line extending for several miles after Mong Nai, but no stations are listed in the Myanma Railways list of stations. See:

Wikipedia website, "List of railway stations in Myanmar", *op. cit.*

It is difficult to investigate this, as travel by foreigners in this part of Shan State is severely restricted (e.g. in February 2016 and again in February 2017 I was not allowed to travel by road from Taunggyi to Kengtung).



Map 26: The line from Taunggyi to Mong Nai in Shan State.

The difficulty of the terrain can be seen from how the line doubles back on itself east of Loi Put (marked by a red arrow in Map 26).

There is a large well-maintained and well-staffed railway station at Taunggyi, similar in style to ones at Dawei and Loikaw, which were built at a similar time. The station at Taunggyi, which is also known as Saw Sei Railway Station, is shown in Plate 129 below.

Plate 129: Taunggyi Railway Station.

The train shown in this photograph is the only one operating on the line: a locomotive, two carriages and a brake van. One service is the No. 153 Up train that departs from Taunggyi at 2:30pm each day, reaching Kakku at 4:30pm. It used to terminate at Htiyi at 7:50pm, but the service now only goes as far as Saikkhaung, arriving there at 5:25pm.[38] The line is unusable after Htiyi. The line heads south from Taunggyi to Kakku, popular with tourists for the numerous stupas there, then continues south to Htiyi before heading north to Namsang and then south to the railhead at Mong Nai. There are thirty-four stations on the line from Taunggyi to Mong Nai, but unfortunately it is only useable up to Htiyi, which is the thirteenth station from Taunggyi.[39] When I visited Taunggyi in February 2016, the return service (No. 154 Down) departed at 4:50am from Htiyi, arriving at Taunggyi at 10:00am. In August 2016 the new NLD government announced that it had closed sixteen short train routes, and changed another fourteen.[40] One route changed was the Taunggyi to Htiyi service, and as a result the train now only goes from Taunggyi to Saikkhaung.

The main function of this line is to bring villagers to the open-air market that operates near Taunggyi Railway Station each day. The villagers arrive laden with produce to sell at the market, before returning home on the train departing at 2:30pm. Villagers arriving at the station can be seen in Plate 130 below.

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[38] An alternative spelling for "Saikkhaung" is "Hsig Khaung" which is the name appearing on the railway station sign.

[39] The stations on the Taunggyi to Mong Nai line are listed in Appendix D.

[40] Htoo Thant, (2016, August 18), *op. cit.*

Htiyi (also known as Thi Yi) is the thirteenth station from Taunggyi, whereas Saikkhaung (also known as Hsaik Hkaung) is the eighth station. Saikkhaung is 41.6 miles from Taunggyi with a further 103 miles to Namsang.

Plate 130: Local villagers arriving at Taunggyi Station on the No. 153 Up service.

The market can be seen in Plate 131 setting up in front of Taunggyi Railway Station before the arrival of the train in the morning.

Plate 131: The open-air market setting up in front of Taunggyi Railway Station.

When I returned to Taunggyi in January 2017 the location of the market had shifted from in front of the station to be on the side. But it was still a very busy market. By January 2017 the timetable was slightly different to one year earlier. The train only goes as far as Saikkhaung now, and leaves Saikkhaung at 5:00am with an arrival

time at Taunggyi of 8:00am, compared to an arrival time of 10:00am under the former timetable. It departs Taunggyi at 2:30pm, arriving at Saikkhaung at 5:25pm. This now gives villagers 6½ hours at the market (8:00am to 2:30pm) compared to 4 hours and 20 minutes in previous years (10:00am to 2:20pm).

The service is so popular with the local villagers that Myanma Railways has a portable ticket office it sets up for the service departing at 2:30pm, saving passengers' time. This can be seen in Plates 132 and 133 below.

Plate 132: The portable ticket office at Taunggyi Railway Station.

Plate 133: Tickets in the portable ticket office at Taunggyi Railway Station.

Clearly, a valuable service is being provided for the local community. But it could be greatly improved. With just one old locomotive on this isolated line, there is a risk of no service if it breaks down.[41] The carriages are old as well, with seating on benches as can be seen in Plate 134 below.

Plate 134: Local villagers on the 2:30pm train, waiting to depart.

[41] The locomotive, DF.2007, is a diesel locomotive and was the seventh of a number of 2,000-horsepower locomotives purchased from Alstom in France. It can be seen in Plate 129.

The carriages (see Plate 135 below) are old and need replacing.

Plate 135: The carriages on the train at Taunggyi Railway Station.

The state of the stations on the line reflects the lack of funds available from Myanma Railways to maintain the line. This is no more apparent than at Kakku, a popular tourist destination because of the many stupas there.[42] The station has no Station Master or any staff. The station building is boarded up (but unlocked) and the station is generally in a run-down condition, as can be seen in Plates 136 to 138 below.

[42] Most tourists are travelling to Kakku either by car or in buses on group tours, but not by train.

Plate 136: Kakku Railway Station, on the Taunggyi to Saikkhaung line.

Plate 137: The boarded-up station building at Kakku Railway Station.

Plate 138: At Kakku Railway Station.

Four out of the eight stations on the line from Taunggyi to Saikkhaung have no Station Master, reflecting the lack of commitment of Myanma Railways to this line.[43]

The line from Taunggyi to Saikkhaung is providing an important service to the rural community, much as does the Aungban to Loikaw line discussed in Chapter 6. I was informed by the railway staff that the last train to travel to Namsang was in 2013. The line needs to be upgraded, and restored to working order to the railhead at Mong Nai. The rolling stock should be replaced with modern coaches and a more modern locomotive. The line is not suited to the use of Rail Bus Engines (RBE's) because of the steepness of the gradient.[44] Improvement in this line – both in the track and the rolling stock – would generate much goodwill for the new NLD government, for it would be seen to be putting funds into a state somewhat neglected by the former national government.

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[43] The four stations with no Station Master are Hpa Mon, Naung Kai, Kakku and Naung Ae. The four with staff are Taunggyi, Hang Si, Ban Yi and Saikkhaung. (This information was provided by the Station Master at Taunggyi).

[44] This advice was provided by the Divisional Traffic Manager whom I met at Shwe Nyaung Station on 28th January 2017.

7.5 The Shan State Railway

The abandoned Shan State Railway sums up the parlous state of Myanma Railways. This railway, which was to run from Kengtung to Mong Nai, was proposed by the former military government in 2009, and was one of four new railway projects that were planned for Shan State.[45] These four railways are listed in Table 55 and shown in Map 27 below.[46]

Railway	Length (miles)
Mong Nai - Tachilek	217
Kengtung - Namsang	199
Hsipaw - Namsang	155
Lashio - Muse	106

Table 55: Four new railway projects that were planned for Shan State in 2009.

Map 27: Four railway projects planned for Shan State in 2009.

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[45] *Shan Herald*, (2009, December 23), "Junta to start construction on Lashio-Muse railroad project". Retrieved from: http://www.shanland.org/index.php?option=com_content&view=article&id=2865:junta-to-start-construction-on-lashio-muse-railroad-project&catid=85:politics&Itemid=266.

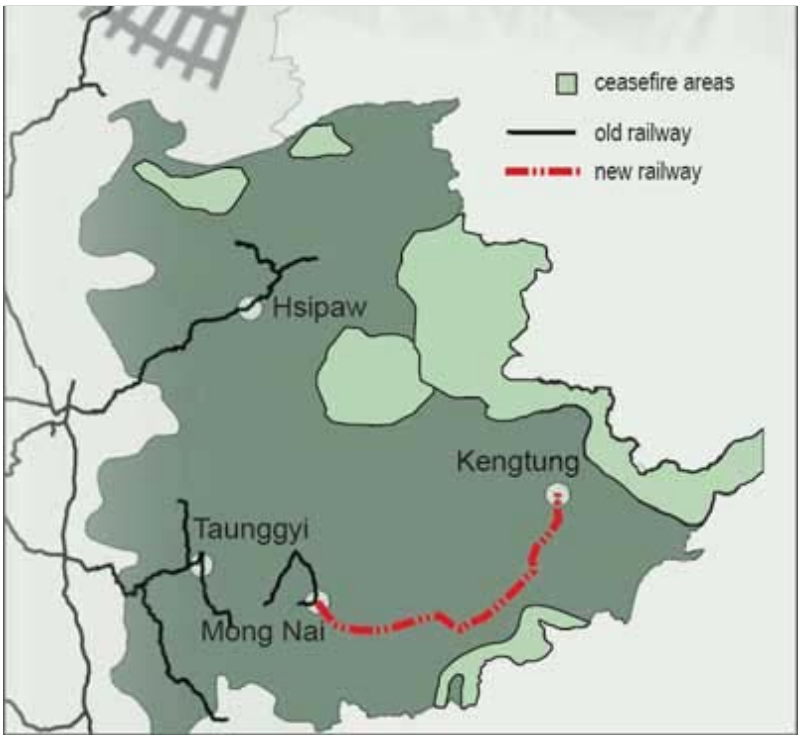
[46] Interestingly, with respect to the Lashio-Muse line, there is already an old line in place, 32 miles long, leading to Mongyaw north-east of Lashio. It was built by the British in World War II. See:

Shan Herald, (2009, December 23), *op. cit*.

There is an element of artistic licence in Map 27 as it has an incorrect route from Taunggyi to Mong Nai, and only shows the Shan State Railway going as far as Kunhing rather than to Namsang as was discussed in the article in the Shan Herald. This map appeared in the article in the Shan Herald. The Lashio-Muse line is also discussed in:

Xinhua News Agency, (2009, November 20), "Myanmar to build new railroad to link Chinese border town". Retrieved from: http://news.xinhuanet.com/english/2009-11/20/content_12510114.htm.

Initially it was intended for one line to run from Kengtung to Namsang, and another from Tachileik to Mong Nai.[47] By mid-2009 the Shan State Railway had been re-defined as running from Kengtung to Mong Nai, a distance of 226 miles, and was one of the thirteen proposed railways announced by Myanma Railways in October 2010.[48] Over three thousand acres of land (1,000 acres of rice fields in Mong Nai and 2,000 acres of agricultural land in Kengtung) were seized by junta authorities to construct the new railway in Shan State, and little compensation was paid.[49] The route of the proposed railway from Kengtung to Mong Nai is shown in Map 28.[50]



Map 28: The proposed Shan State Railway.

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[47] Hseng Khio Fah, (2010. March 4), "Thousands of acres seized for Mongnai-Kengtung rail link", Burma News International. Retrieved from: http://e-archive.bnionline.net/index.php/news/shan/8023-thousands-of-acres-seized-for-mongnai-kengtung-rail-link-.html.

Namsang is shown as "Namzang"in Map 27, but the usual spelling is "Namsang".

[48] Moe Myint Lin Let, (2010, October 30), *op. cit.;* and

The New Light of Myanmar, (2009, July 22), "Commander inspects Moenai-Kengtung railroad project". Retrieved from: http://www.burmalibrary.org/docs07/NLM2009-07-22.pdf; and

The New Light of Myanmar, (2009, December 9), "Prime Minister inspects ceremony to destroy seized narcotic drugs in Kengtung". Retrieved from: http://www.burmalibrary.org/docs08/NLM2009-12-09.pdf.

[49] Hseng Khio Fah, (2010. March 4), *op. cit.;* and

Wai Moe, (2010, August 17), "Shan State Railway to Suppress Armed Ethnic Groups: Rights Groups", The Irrawaddy. Retrieved from: http://www2.irrawaddy.com/article.php?art_id=19239.

[50] *Mizzima*, (2010, August 18), "Railway 'to abet junta's war in Shan State'. Retrieved from: http://archive-2.mizzima.com/news/inside-burma/4259-railway-to-abet-juntas-war-in-shan-state.html.

The route shown in Map 28 is different to the one from Kengtung to Namsang shown in Map 27 above, as it heads further south towards the Thai border, passing in particular through the town of Mong Kok.[51] The proposed line from Kengtung to Mong Nai was broken down into three sections, as shown in Table 56 below.[52]

Section of railway	Length (Miles)
Kengtung - Mong Hsat	87
Mong Hsat - Tahsan	72
Tahsan - Mong Nai	67
	226

Table 56: The three sections of the proposed Shan State Railway.

In a report published in 2010 it was alleged by two Shan human rights groups that the objectives of constructing the line were:[53]

(i) to facilitate the export of brown coal from the Mong Kok coalfields.

(ii) to enable the rapid deployment of Tatmadaw troops and military equipment.

The report boldly declared:[54]

This is not a passenger railway, it's for the army's howitzers and tanks.

The ethnic groups claimed that the purpose of the planned line between Mong Nai and Kengtung (the so-called Shan State Railway) was solely a military one. The line was planned to link with the Taunggyi to Mong Nai line. Taunggyi is the headquarters of the Eastern Regional Military Command of the Tatmadaw, while the Triangle Regional Military Command is based in Kengtung. The ethnic groups asserted that:[55]

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[51] *Ibid*.

[52] Maung Maung Myint Swe, (2010, March 14), "Kengtung-Monghsat railroad linking to all states and divisions", The New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs08/NLM2010-03-14.pdf.

"Mong Hsat" is also spelt as "Monghsat". Tahsan is shown as "Tasang" in Map 27.

[53] *Shan Women's Action Network* and *Shan Human Rights Foundation*, (2010, August 16), "New Rail Link to Eastern Shan State Spells War Escalation", *Burma Partnership* website. Retrieved from: http://www.burmapartnership.org/2010/08/new-rail-link-to-eastern-shan-state-spells-war-escalation/; and

The Nation, (2010, August 17), "Death railway in Shan State". Retrieved from: http://www.nationmultimedia.com/home/2010/08/17/national/Death-railway-in-Burmas-Shan-State-30136021.html.

[54] *Shan Women's Action Network and Shan Human Rights Foundation*, (2010, August 16), *op. cit*.

[55] Wai Moe, (2010, August 17), *op. cit*.

The rail project is for transporting the junta's armour and artillery from divisions in the southern to the eastern part of the state. It is the first railway to cross the Salween River in Shan State.

They pointed out that the railway's real purpose was to transport military equipment, as it takes one day to travel from Taunggyi to Kengtung by road, but on the proposed railway it would take three days.[56] The two Shan human rights groups were the Shan Women's Action Network and the Shan Human Rights Foundation. Their comments must be treated with caution given their political stance, but the comments are consistent with the political climate of the time and the nature of the construction work that was carried out on the new railway. For example, the report alleged that:[57]

The speed and ruthlessness with which the railway is being carved through this isolated border area reveal a much more sinister agenda.

The poor quality of construction is discussed later in this chapter. The route used for the initial part of the railway is poor and the quality of construction is poor. This is consistent with it having been built in haste, and is similar to what happened to the Hsipaw-Laihka-Namsang Railway where construction was started but quickly abandoned.[58] The report also noted that the route planned for the railway:[59]

cuts strategically between the northern and southern territories of the United Wa State Army (UWSA), Burma's biggest ceasefire group which has resisted pressure by the junta to surrender their weapons.

The military is now taking a less dominant role as the country moves towards democracy under the new NLD government, but nevertheless there are sound economic arguments to support the construction of the Shan State Railway, such as the transport of agricultural products and the transport of villagers in the rural regions.

Construction of the line for the Shan State Railway started at Kengtung in 2009, and by March 2010 construction of an 87-mile line from Kengtung to Mong

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[56] *Ibid.*

[57] *The Nation*, (2010, August 17), *op. cit*.

As an example of ruthlessness, when I was in Kengtung in early February 2017 I was informed (by a motorbike taxi-driver) that the Shan State Railway had gone straight through a cemetery. I did see a cemetery as I was following the line on 2nd February 2017. It was also quite evident that good agricultural land had been taken for the railway. The speed at which the line was built is reflected in its poor quality.

[58] Stubbs, (2012, November 26), *op. cit.*

[59] *Shan Women's Action Network and Shan Human Rights Foundation*, (2010, August 16), *op. cit*.

Hsat was being reported in the press. Construction was temporarily suspended in July 2010 due to heavy rain that caused some areas of construction to collapse, and also because of mechanical problems with vehicles.[60] There were eighteen stations planned for the Mong Hsat section of the line and 461 bridges.[61] By December 2010 the line had reached Wenkaung, 5.6 miles from Kengtung, with stations being built at Kengtung (near Kyainge Tong University) and at Wenkaung.[62] This section of the line was opened with great fanfare on 19th December 2010, with Myanma Railways declaring it had built seventeen bridges in addition to the two stations.[63] Further construction of the line was abandoned soon after. In addition to inclement weather conditions, the Shan State Railway and the other three railways listed in Table 55 were victims of the changing political situation in Burma. It was the military junta who proposed the four railway projects in 2009. By 2010 President U Thein Sein had been elected to head a quasi-military government, and this change of political direction probably prompted the cancellation of all four projects, as they were to be built primarily to support the military in Burma.[64]

I first visited the railhead at Kengtung in 2013. All there was to show of the Shan State Railway on which construction had been abandoned was a small railway station at Kengtung, three diesel railcars (RBE's) near the station, and

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[60] Hseng Khio Fah, (2010, August 8), "Kengtung railroad construction project suspended", Shan Herald. Retrieved from: http://www.shanland.org/index.php?option=com_content&view=article&id=3134:6-august-201`0&catid=90:environment&Itemid=287; and

Maung Maung Myint Swe, (2010, March 14), *op. cit.*

One example of an area that has collapsed can be seen in Plate 152 later in this chapter, with smaller collapsed areas shown in Plates 149 and 150.

[61] Maung Maung Myint Swe, (2010, March 14), *op. cit.*

For there to be 18 stations on an 87-mile section of line means that on average the stations would be only 5.1 miles apart, which seems very close for a rural line. For the bridges, 461 bridges in 87 miles represents just over five bridges per mile of track.

[62] The university is also known as Kengtung University. The above spelling, "Kyainge Tong", is on the main entrance to the university.

[63] *The New Light of Myanmar*, (2010, December 21), "Kengtung-Wenkaung railroad section of Mongnai-Kengtung railroad project inaugurated". Retrieved from: http://www.burmalibrary.org/docs09/NLM2010-12-21.pdf; and

Hettler, (2013, August), *op. cit.*

The two stations referred to were at Kengtung and Wenkaung.

[64] See, for example:

Stubbs, (2012, November 26), *op. cit*.

several miles of track.[65] To describe it as "several miles of track" hides the fact that some substantial earthworks were carried out during the construction of these first few miles, as will be seen in some of the photographs below (see Plates 145 to 152).

A photograph taken at the railway station in Kengtung is shown in Plate 139.

Plate 139: At Kengtung Railway Station.

"*Kengtung*" is spelt "*Kyaing Tong*" on this railway sign. Marshall refers to this spelling as being "the military's needless Burmanization of 'Kengtung' ", and "a part of a systematic assault on Shan culture".[66] In many ways, it was simply one facet of the repression of the Shan people by the former military government in Nay Pyi Taw, and it is not surprising that construction of the Shan State Railway was cancelled. The main motive of the former military government in Nay Pyi Taw proposing the line in the first place was almost certainly a military one.

The railway station is a small block station and was being looked after in 2013 by a caretaker.[67] The pavilion built for the opening ceremony was in a state of disrepair in 2013, and by my second visit in February 2016 this pavilion had been

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[65] The railway station is opposite Kengtung University, which is on the outskirts of Kengtung, on the road to Taunggyi.

[66] Marshall, Andrew, (2002), "The Trouser People", Viking (a part of the Penguin Group), United Kingdom, p.192 and p.199.

[67] The station at Kengtung is similar in construction to one shown in Plate 107 in Chapter 6 on the Aungban-Loikaw line. Curiously, on the railway sign in front of the station office, the name "Kyaing Tong" had been obliterated, but the Burmese script had not been touched.

destroyed. A photograph taken in 2013 of the station with the pavilion behind it is shown in Plate 140.

Plate 140: The small block station at Kengtung Railway Station in 2013.

To build such a small railway station for the railhead of this new railway suggests a lack of commitment and no doubt funds as well. Compare this to the recently built station at Minbu on the Kyangin-Pakokku line on the west bank of the Irrawaddy River (see Plate 69 in Chapter 5). Strategically Kengtung is a more important town than Minbu, as Kengtung is a major city in Shan State and lies at the centre of the Golden Triangle. The station at Kengtung should have been of similar size and quality to that at Minbu, especially since Kengtung is the railhead. To build just a block station at Kengtung underlines the lack of commitment of Myanma Railways and the former government in Nay Pyi Taw to the construction of the Shan State Railway.

There are three Rail Bus Engines (RBE's) lying idle near Kengtung Station. In 2013, they were still in reasonable condition. Plate 141 shows them in 2013.[68] The three abandoned RBE's are RBE 25.48, RBE 25.62 and RBE 25.63. The government-appointed guide, whom I was forced to employ when visiting Kengtung, was very reluctant to let me see this abandoned railway in 2013.[69]

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[68] I have visited Kengtung four times (in February 2010, January 2013, February 2016 and most recently in February 2017). I was able to observe the abandoned railway construction on the last three trips.

[69] The guide can be seen in Plate 141 which shows the three RBE's in January 2013 when they were in quite good condition.

Plate 141: Three RBE's lying idle at Kengtung Railway Station in January 2013.

The diesel railcars were transported to Kengtung by road and were left lying idle at Kengtung Railway Station after being used at the opening ceremony for the line. They should have been put into service on other parts of the Myanma Railways network. In 2013 I was able to follow the track for about a mile, with my government guide in tow. The quality of construction of the track was quite poor, with two wooden sleepers for every one concrete one, and poorly held into place, as can be seen in Plate 142.

Plate 142: The railway track at Kengtung Railway Station.

The track in Plate 142 was at the railway station, and although the rails were poorly held in place this portion of the track was much better than later sections. When I

returned three years later, the pavilion adjacent to the railway station had been destroyed, and the station was in a dilapidated condition. The three RBE's were still there, but had been stripped of anything of value. They had been jacked up and had their wheels removed; all seats were removed; and several windows were smashed. The three badly vandalised RBE's which were beyond repair are shown in Plates 143 and 144 below.

Plate 143: The three vandalised RBE's at Kengtung in February 2016.

Plate 144: An RBE with its wheels removed and badly vandalised, at Kengtung in February 2016.

By myself this time without a government minder, I was able to follow the track for three hours until it petered out. Some of the railway cuttings had several inches of mud and water, with the tracks disappearing from sight, as can be seen in Plates 145 to 147.[70]

Plate 145: Track covered with mud in a cutting on the Shan State Railway.

Plate 146: Rail tracks visible under water in a cutting at Kengtung.

[70] The railway alignment is actually used as a track now by local villagers. Two elderly heavily-laden Akha villagers can be seen in Plate 147.

Plate 147: A heavily water-logged section of the Shan State Railway.

This was in the dry season, and it highlights the poor planning of the railway construction, putting the line on a route where tracks can become covered by mud and water even in the dry season. Towards the end of the line, a major embankment had been built with the single rail line on top, as shown in Plate 148.

Plate 148: The line on top of an embankment.

But parts of the embankment had been badly eroded, and the track was very unsafe and broken in places, as can be seen in Plates 149 and 150 below.

Plate 149: Badly eroded land along the track alignment.

Plate 150: Badly eroded land near the end of the Shan State Railway.

The section of the railway shown in Plate 150 above was the furthest point of the line that I reached when I was on fieldwork in February 2016. I returned one year later on 2nd February 2017 and was able to continue for a further 45 minutes along the alignment. Initially the ground was very boggy and difficult to follow, and there was no sign of a rail line. But then the alignment I was following emerged into a

clearing and a track in quite good condition was apparent. A Tatmadaw soldier told me it was 10-15 minutes' walk to Wenkaung village where the line ends. Probably the better quality line had been built starting from the Wenkaung end of the line. I continued on for a further twenty minutes, only to find that the line to Wenkaung village had collapsed into a huge gorge caused by erosion. Plate 151 below shows the condition of the track just before the huge gorge, and Plate 152 shows the huge gorge itself.

Plate 151: The condition of the track just before the huge gorge.

Plate 152: The huge gorge into which the track had collapsed.

The telling thing in Plate 152 is the railway semaphore signal pole on the other side of the gorge (indicated by the red arrow). This shows how massive the erosion was and how deep the gorge was, and is an indictment of Myanma Railways and their lack of technical skills in building railways. The gorge was unsafe to cross so I turned back. Three days later I took a motorbike taxi to Wenkaung village expecting to be able to approach this semaphore signal from the other side of the gorge. But unfortunately I could not find it, nor was there any sign of a railway station (i.e. similar to the one at Kengtung).[71] This fieldwork and these photographs highlight not only the poor construction standards of the first attempt at building the Shan State Railway, but also the challenges that will be faced when another attempt is made sometime in the future.

Myanma Railways staff lack the technical skills to build new railways in my opinion. The Shan State Railway graphically highlights this, as does the line from Kyangin to Pakokku on the west bank of the Irrawaddy River (see Chapter 5). To

[71] I was given conflicting information about the existence of the station at Wenkaung village: an army captain said it was there but was difficult to access as it was on army land; a motorbike taxi-driver said it had never been built.

start construction of the Shan State Railway at Kengtung and to then abandon it so quickly demonstrates the poor planning by Myanma Railways and the government in Nay Pyi Taw, and the fact that new projects are announced merely for political or military reasons and often end up never being finished, or indeed hardly started.[72] I was however surprised by the extent of the work that had already been done on the railway, even if only for a few miles.[73] An example is shown in Plate 153 below.

Plate 153: The Shan State Railway, not far from where it ended.

This section of the line had extensive earthworks including embankments (such as the one shown in Plate 148 above). It was within half a mile of the section of the line shown in Plate 150 above. Much more work was done on the Shan State Railway than on the Hsipaw-Laihka-Namsang Railway that was also abandoned in the early stages of construction. If construction of the Shan State Railway is ever re-started in the future, it will be a massive and expensive undertaking.

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[72] Other examples of abandoned railway projects are the Dawei-Myeik line and the Hsipaw-Namsang line. For the latter, the project was abandoned after a small amount of earthworks was done. See:

Stubbs, (2012, November 26), *op. cit.*; and

Stubbs, (2012, March 31), *op. cit.*

[73] Some of the extensive earthworks carried out using heavy machinery can be seen in articles in *The New Light of Myanmar* from 2009 and 2010. See:

The New Light of Myanmar, (2009, December 9), *op. cit*.; and

Maung Maung Myint Swe, (2010, March 14), *op. cit*.

An issue that could affect the possible construction of the Shan State Railway is the possible construction on the Salween River of the Tasang Dam, also known as the Mong Ton Dam, in southern Shan State. The plan was for the dam to have a reservoir of 870 km^2 with an installed capacity of 7,000 megawatts to generate over 35,000 gigawatt-hours annually of electricity.[74] The original estimated cost of the dam was US$6 billion, but by 2015 this figure had increased to US$10 billion.[75] A groundbreaking ceremony was held in early 2007, but there has been little activity since 2008.[76] In 2015 Thailand, Burma and China were on the brink of signing a Memorandum of Understanding to build the dam.[77] Human rights abuses and land-confiscation issues have been key issues with the proposed dam.[78] Both the construction of the Shan State Railway and the Tasang Dam are problematic. If the Tasang Dam were to go ahead, this would have a major impact on any proposed railway in the area, as some of the proposed route would be underwater. For example, Kunhing (shown in Map 27) which is a major township on the route, would be flooded.[79] Fighting has broken out between rebels and government troops near the Tasang Dam site over concern about the construction of the dam.[80]

A railway in this part of Shan State linking Kengtung to Taunggyi, possibly via Mong Nai, makes economic sense, but it will not be built in the foreseeable future. It will probably be at least twenty years before it is built, the reasons being:

- Lack of technical skills in Myanma Railways.

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[74] *World Rainforest Movement*, (2009, August), "Burma: The looming social and environmental disaster of the Tasang Dam". Retrieved from: http://wrm.org.uy/oldsite/bulletin/145/Burma.html; and

Burma Rivers Network, (2013, March 13), "Current Status of Dam Projects on Burma's Salween River". Retrieved from: http://burmariversnetwork.org/images/stories/publications/english/English-Salween.pdf; and

Burma Rivers Network, (2008, August 18), "Mong Tom Dam (Tasang Dam). Retrieved from: http://burmariversnetwork.org/index.php?option=com_content&view=article&id=64&Itemid=78.

[75] *Burma Rivers Network*, (2008, August 18), *op. cit*.

[76] *Ibid*.

[77] Aung Shin, (2015, July 17), "Thanlwin dam still in the planning stages", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/business/15548-thanlwin-dam-still-in-the-planning-stages.html.

[78] Mathieson, David, 2007, quoted in:

McLeod, George, (2007, September), "Ta Sang: a weapon of war", Himal. Retrieved from: http://old.himalmag.com/component/content/article/1300-ta-sang-a-weapon-of-war.html.

[79] *Burma Rivers Network*, (2013, March 13), *op. cit*.

[80] Gray, (2014, Denis D., December 11), "Dam Projects Reigniting Burma's Civil War", The Irrawaddy. Retrieved from: https://wwwf.irrawaddy.com/news/burma/dam-projects-risk-reigniting-burmas-civil-war.html.

- The hilly and mountainous terrain that needs to be traversed in order to reach Taunggyi.
- Cost, due to the hilly and mountainous terrain.

In the short term, the new NLD government should probably have as a higher priority the improvement of the road between Taunggyi and Kengtung.

The line, when and if it is ever built, will be expensive. It need not follow the route shown in Map 28 above. That route was planned by the military and heads south from Kengtung towards the Thai border, passing through the town of Mong Kok. The railway should in essence run from Kengtung to Taunggyi, perhaps via Mong Nai but not necessarily. An interesting option would be to have a branch line to Tachileik, coming off from the main line from Kengtung to Taunggyi, or perhaps going directly from Tachileik to Kengtung (a distance of 100 miles).[81] Tachileik is the gateway to the northern part of Thailand, and is one of several international land crossings currently in use by Burma. The Thai town on the other side of the border is Mae Sai. Currently the railway in Thailand only runs as far as Chiang Mai. But as discussed in Chapter 4, Thailand is looking to expand its rail network. A line linking Chiang Mai to Chiang Rai is quite feasible. If it were extended to Mae Sai, this opens up the possibility of an international rail link to Burma, with Tachileik being the point of entry. Both countries use metre-gauge track, so there would be no break-of-gauge issues. Plans for a line from Mong Nai to Tachileik were put forward in 2009, as shown above in Table 55 and Map 27 above. But instead of a line between Tachileik and Mong Nai (a distance of 217 miles) as shown in Map 27, a branch line coming off from a line linking Taunggyi and Kengtung would probably make more sense.[82]

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[81] The view of a "veteran border watcher" in 2009 was that if the Shan State Railway (proposed at that time to be from Kengtung to Namsang) or a line from Tachileik to Mong Nai were built, a logical outcome would be a line from Tachileik to Kengtung. See:

Democracy for Burma, (2009, December 10), "New strategic railroad project in Shan State". Retrieved from: https://democracyforburma.wordpress.com/2009/12/10/new-strategic-railroad-project-in-shan-state/.

[82] I am grateful to Mr Martin Michalon for a question at my presentation on 7th October 2016 at the International Burma Studies Conference in DeKalb Illinois about a possible line to Tachileik.

7.6 The Economic Importance of Railways to Shan State

Shan State is a major agricultural producer, producing approximately 8% of Burma's agricultural output in 2015, as can be seen in Table 57 below.[83]

Commodity	Shan State (000's acres)	Burma (000's acres)	Shan State's Production as % of Burma's Production
Cereals	1,954	19,100	10%
Vegetables and Fruit	366	3,173	12%
Beverage	337	802	42%
Pulses	318	10,023	3%
Miscellaneous	185	1,739	11%
Oilseeds	171	5,967	3%
Spices and Condiments	64	539	12%
Tobacco and Betel	3	305	1%
Fibre	1	752	0.1%
	3,398	**42,000**	**8%**

Table 57: Agricultural sown acreage in Shan State in 2015.

The figure for Shan State for "Vegetables and Fruit" is high because of the large amount of tomatoes produced at Inle Lake, and the figure for "Beverages" is high because of tea production at Nahmsan in northern Shan State. The "Miscellaneous" category contains rubber, coconut and medicinal plants, with the bulk of the figure for Shan State coming from rubber.

Another area of economic importance for Shan State is forestry, even though the new government has brought in a temporary ban on all logging of teak and hardwood.[84] Deforestation has been a major issue in Burma for a number of years

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[83] *The Government of the Republic of the Union of Myanmar*, (2015, December), *op. cit*., Table 9.12, pp.219-236.

I have used sown acreage as a proxy for production.

[84] McLaughlin, Timothy and Aung Hla Tun, (2016, April 28), "Myanmar bans lucrative logging in bid to preserve forests", Reuters. Retrieved from: http://www.reuters.com/article/us-myanmar-economy-logging-idUSKCN0XP1JT; and

Nyein Nyein, (2016, June 3), "Logging Ban Requires a Strong Government Hand, Say Environmentalists", The Irrawaddy. Retrieved from: http://www.irrawaddy.com/burma/logging-ban-requires-a-strong-government-hand-say-environmentalists.html; and

Schlaefli, Samuel (2016, December 16), "When selling is more lucrative than protecting: Myanma Timber Enterprise and the deforestation crisis", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/national-news/24249-when-selling-is-more-lucrative-than-protecting-myanma-timber-enterprise-and-the-deforestation-crisis.html.

and has led to the ban on logging by the new government. In June 2016 forestry officials announced plans to plant 100,000 trees in Shan State is response to the deforestation concerns.[85] The trees will be planted in areas such as Kyaukme, Hsipaw and Namtu.

For the period 2011-2015 Shan State accounted for 9.2% of the combined teak and hardwood production for Burma, and 5.2% of the milling throughput of hardwood and 5.3% of the milling outturn of hardwood.[86] Longer term, logging will resume and railways can have a role to play in transporting the timber, as is done in other parts of the world. In 2015 timber was the third highest category of commodity transported by rail in Burma, as was shown in Table 27 in Chapter 3. The largest two categories were "Railway Departmental" and "Stone and ballast". The total tonnage of timber transported by rail in Burma in 2015 was 131,000 tons. To put this figure in perspective, the amount of teak and hardwood extracted in Burma for the year ended 31st March 2015 was 742,000 tons, as is shown in Table 58 below.[87]

Type of timber	Volume of logs extracted (000's cubic tons)	Milling throughput (000's cubic tons)	Milling outturn (000's cubic tons)
Teak	128	17	7
Hardwood	614	78	49
Total	**742**	**95**	**56**

Table 58: Production of teak and hardwood in Burma in 2015.

Timber is also transported by road, in particular the large amount of timber that is sold to China. Railways can and should have a role to play in transporting the timber being harvested, especially if it is being transported to Yangon rather than

This ban will be partially relaxed from the 2017-18 fiscal year with logging of aged timber allowed in Sagaing Division and Kachin State. See:

Nyein Nyein, (2016, November 17), "Govt to Resume Harvesting Timber", The Irrawaddy. Retrieved from: http://www.irrawaddy.com/news/burma/govt-resume-harvesting-timber.html.

[85] Maung Zaw, (2016, June 7), "Forest dept replants trees in Shan State", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/national-news/20714-forest-dept-replants-trees-in-shan-state.html.

[86] *The Government of the Republic of the Union of Myanmar*, (2015, December), *op. cit*. Table 10.04 on p.278-279 and Table 10.13 on p.288-289.

[87] *Ibid*.

being sold to China. An improvement in the railway system in Shan State could help facilitate the transport of timber from this state.

Even though the original motive for the Shan State Railway was undoubtedly a military one, there are sound economic reasons for resuming construction, as well as improving the two existing branch lines (Mandalay-Lashio and Thazi-Yaksauk), to help transport agricultural produce and timber.

7.7 Conclusion

This chapter has highlighted the state of the railways in southern Shan State. The immediate priority of the new NLD government should be to construct a line between Taunggyi and Shwe Nyaung, following either the existing alignment or a better one. This would make Taunggyi a part of the main Myanma Railways network. A second priority should be the repair and improvement of the Taunggyi-Kakku-Namsang-Mong Nai line (including providing modern rolling stock) as it provides a valuable service to the rural community. A third priority and much longer-term one is the Shan State Railway that would see Kengtung linked to the Myanma Railways network. Even if the original motive for constructing the Shan State Railway was a military one, this does not mean it should not be constructed in the future. It need not follow the route proposed in 2010, and also it would be far more valuable if it linked Kengtung directly to Taunggyi rather than going to Mong Nai to join up with the existing railway. The route from Taunggyi to Mong Nai is long and circuitous, as can be seen in Map 26 above. The Taunggyi to Mong Nai line should be made fully operational again, but need not be a part of the much more ambitious Shan State Railway that should probably run from Kengtung to Taunggyi and on to Shwe Nyaung.

The new NLD government revamped the 2016-2017 Budget of the former government, putting more emphasis on education, health and social welfare.[88]

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[88] *The Global New Light of Myanmar*, (2016, June 16), "A Development Agenda. New budget to focus on development, U Htin Kyaw". Retrieved from: http://www.burmalibrary.org/docs22/GNLM2016-06-16-red.pdf; and

San Yamin Aung, (2016, June 16), "Financial Commission Moves to Reapportion Union Budget", The Irrawaddy. Retrieved from: http://www.irrawaddy.com/burma/financial-commission-moves-to-reapportion-union-budget.html.

President Htin Kyaw stressed that by increasing spending in these three areas the government will:[89]

> *focus attention on policies for rural development, electrification, poverty alleviation and infrastructure development.*

The improvement and expansion of the railway system in southern Shan State is consistent with these policies, as it is infrastructure development and will aid rural development in Shan State. The new government could create a great deal of political goodwill for itself in Shan State by improving and expanding the railway system in southern Shan State, and should give urgent priority to the construction of the Shwe Nyaung to Taunggyi line. A key issue of course is the continuing unrest in Shan State with clashes between the Tatmadaw and ethnic groups.[90] Until this is resolved, major projects such as the Shan State Railway cannot go ahead.

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[89] San Yamin Aung, (2016, June 16), *op. cit.*

[90] Mathieson, David (2016, October 9), "Fueling Resistance and Rebel Recruitment: Narratives of Human Rights Violations in Burma's Civil War". A paper presented at the International Burma Studies Conference held at Northern Illinois University, October 7-9, 2016; and

Kantar, Sally, (2016, October 11), "Burma Studies Conference Highlights Limits to Democratic Change", The Irrawaddy. Retrieved from: http://www.irrawaddy.com/burma/burma-studies-conference-highlights-limits-democratic-change.html.

Chapter 8

INTERNATIONAL LINKS AND OTHER ISSUES

8.1 Introduction

Burma's railway network is at present isolated from the railway networks in its neighbouring countries. With the changing political situation in the country and the apparent desire of the former government in Nay Pyi Taw as well as the new NLD government to engage with other countries, particularly ones in the ASEAN region, it is not surprising that international rail links are on the agenda. A potential link between China and Burma has been discussed in Chapter 4. Another potential link is with India with a line from Mandalay to Tamu on the Indian border, and then crossing into India, to link up with a line that the Indian government is endeavouring to build from Jiribam to Imphal and then to Moreh on the border with Burma. Bangladesh hopes to build a rail link to Burma via Gundam in Rakhine State, but such a line is many years off. A fourth potential link is with Thailand. The most likely link to Thailand is one from Dawei in Burma to Kanchanaburi, to join a line from there that will eventually go to Vietnam. It is a part of the East West Economic Corridor, and is an effort to increase regional connectivity as part of ASEAN's goal to have a more integrated economic community.[1]

This chapter will discuss several topics, including these potential international links with India, Bangladesh and Thailand. The topics discussed are:

- A proposed railway from India to Burma.
- Long-term plans for a railway from Bangladesh to Burma.
- A possible railway from Dawei to Thailand.
- The importance to the railways of peace in Burma.
- Upgrading the Yangon to Mandalay line.
- The line from Mandalay to Myitkyina.
- The transport of pulses (a topic related to the possible rail link to India).
- The modernisation of the Circular Railway in Yangon.

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[1] *The Global New Light of Myanmar*, (2015, March 15), "Japan, Thailand to speed up talks on railway development". Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-03-15-red.pdf.

- The failed attempt to re-establish a tram service in Yangon.
- An optical fibre cable network along the railway lines.
- The minister responsible for Myanma Railways.
- A line from Sittwe to Minbu.
- The Arakan Light Railway.

8.2 A Proposed Railway from India to Burma

A railway heading west from Burma has been mooted for many years. J.T. Lawrence, writing in *The Railway Gazette* in 1899, boldly proclaimed that:[2]

> *in the not too distant future Rangoon and Calcutta will be joined,* viâ *Prome and Chittagong.*

In 1899 the railway in Burma extended to Prome (modern-day Pyay) in the west and Myitkyina in the north, and modern-day Pakistan and Bangladesh were a part of India. Lawrence's view was that:

> *The western line goes to Prome in the first instance, and will ultimately join Chittagong, from which place communication is open to Calcutta by the Assam-Bengal Railway and numerous ferries.*

Over a century later, there is still no line to India or Bangladesh from Burma. A line may well be built from Burma to Chittagong in Bangladesh one day, but the line that will most likely be built in the foreseeable future is one to India, via Tamu in Sagaing Region in north-west Burma.

A line from India to Burma is one of the missing links of the Trans-Asian Railway.[3] The principal route of the Trans-Asian Railway is planned to pass through Assam and Manipur into Burma. In 2015 Indian policy makers suggested Assam and Manipur might be bypassed, with the line instead heading south through the Indian states of Tripura and Mizoram, and then into Burma, connecting with the Myanma Railways network at Kalaymyo.[4] However the plan remains to

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[2] Lawrence, J.T., (1899), "Notes on Railways in Ceylon and Burmah", The Railway Magazine, Vol. V, July to December 1899, pp.136-144.

[3] *Economic and Social Commission for Asia and the Pacific*, (2000), *op. cit*.

[4] Kalita, Prabin, (2015, February 5), "Core Euro-Asia rail route may skip Assam, Manipur", The Times of India. Retrieved from: http://timesofindia.indiatimes.com/india/Core-Euro-Asia-rail-route-may-skip-Assam-Manipur/articleshow/46126287.cms.

Kalaymyo is currently cut off from the rest of the rail network in Burma as the line between Kalaymyo and Pakokku is blocked, as was discussed in Chapter 5.

build a line through Imphal in Manipur. As a construction official from India's Northeast Frontier Railways indicated in 2015:[5]

> *As of now we are going ahead with the original Trans Asian Railway plan. A plan for connecting Imphal with Tamu is on, but is frequently hit by trouble in Manipur.*

Construction is happening on the Indian side, with a line being built from Jiribam to Imphal in Manipur. The Jiribam-Tupul-Imphal line was due for completion by December 2016, but insurgency issues and the difficulty of building a railway in mountainous terrain has delayed completion, probably until late 2019.[6] Nevertheless, the Jiribam-Tupul-Imphal line is one of the fastest advancing project among 34 national rail projects.[7] Construction is difficult, and includes a tunnel that is 11.55 kilometres long and a bridge over the Irang River described as the highest bridge in the world with a pier height of 141 metres.[8] A section of line from Jiribam to Dholakhal was completed and commissioned in March 2016, and is being used for goods trains. Jiribam to Tupul is 84 kilometres, and 29 of the 37 tunnels had been completed as at October 2016.[9]

An important aspect of this line has been the gauge conversion (from metre gauge to broad gauge) of the line from Silchar to Jiribam. This was completed with the conversion of the Arunachal-Jiribam line in February 2016.[10] The Minister of

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[5] *Ibid*.

[6] There have been significant insurgency problems in Manipur, with more than 1,500 people allegedly killed in extra-judicial executions by India's security forces between 1979 and 2012. See

Biswas, Soutik, (2017, July 3), "Counting the dead in Manipur's shoot-to-kill war", BBC News. Retrieved from: http://www.bbc.com/news/world-asia-india-40271353.

[7] *Imphal Free Press*, (2015, January 29), "Chief Minister assures setting up a Rani Gaidinliu memorial site in Imphal". Retrieved from: http://ifp.co.in/page/items/25116/chief-minister-assures-setting-up-a-rani-gaidinliu-memorial-site-in-imphal.

[8] Sharma, K. Sarojkumar, (2016, November 13), "Manipur gets country's longest safety rail tunnel", The Times of India. Retrieved from: http://timesofindia.indiatimes.com/city/imphal/Manipur-gets-countrys-longest-safety-rail-tunnel/articleshow/55397975.cms; and

Kalita, Prabin, (2016, July 31), "Prabhu lays foundation of new railway station in Manipur", The Times of India. Retrieved from: http://timesofindia.indiatimes.com/city/guwahati/Prabhu-lays-foundation-of-new-railway-station-in-Manipur/articleshow/53472094.cms.

[9] Sharma, (2016, November 13), *op. cit.*

[10] *The Sentinel*, (2016, February 24), "BG conversion: Arunachal-Jiribam route to connect to Imphal". Retrieved from: http://www.sentinelassam.com/cachar/story.php?sec=2&subsec=12&id=258469&dtP=2016-02-26&ppr=1; and

Barrow, Keith, (2015, November 23), "Indian gauge conversion projects move forward", International Railway Journal. Retrieved from: http://www.railjournal.com/index.php/asia/indian-gauge-conversion-programme-moves-forward.html; and

Railways, Mr Suresh Prabhu, stressed the importance of gauge-conversion projects such as this in bringing the state of Manipur onto the broad-gauge map of the Indian Railways' network. The importance of the gauge conversion should not be under-estimated. This is because Jiribam is now a part of India's broad-gauge network (most of India's railways are broad gauge), and there should be an extra incentive for a new line (broad gauge) to be built from Jiribam to Imphal, the capital of the state of Manipur.

It is anticipated that the Jiribam-Tupul section of the line will be completed by March 2018.[11] It is a further 27 kilometres from Tupul to Imphal, and it is hoped that the line from Tupul to Imphal will be commissioned by December 2019.[12] A foundation stone has already been laid for the new station at Imphal.[13] In addition to the mountainous terrain on the Indian side of the border, the Jiribam-Imphal line is facing a number of problems:[14]

- There are 33 militant groups operating in the area.
- Economic blockades and bandhs (general strikes) are common.
- There have been kidnappings as well as shots being fired at workers.
- The roads are in poor condition (e.g. National Highway 37), which hampers the transport of materials and machinery.

Once the Jiribam-Imphal line is completed, there are plans to extend it in phases from Imphal to Moreh on the border.[15] I visited Imphal in January 2014, but travel from there to Moreh needed to be done as part of a convoy, with armed guards due to insurgency unrest.[16] I did not travel to Moreh. The road from Imphal to Moreh has been described as running "*through hills infested with several insurgent*

Indian Railways, (2016, February 25), "Highlights of the Railway Budget 2016-17". Retrieved from: http://www.indianrailways.gov.in/railwayboard/uploads/directorate/finance_budget/Budget_2016-17/RailBudgetSpeech_2016-17_Hinglights_Eng.pdf.

[11] *The Sangai Express,* (2016, November 1), "Imphal-Tupul railway line. Railway Minister sets 2018 target". Retrieved from: https://www.thesangaiexpress.com/imphal-tupul-railway-line-railway-minister-sets-2018-target/.

[12] Samudra Gupta Kashyap and Adam Halliday, (2015, July 2), "Massive push to railway infrastructure underway in Northeast", The Indian Express. Retrieved from: http://indianexpress.com/article/explained/the-new-northeast-expresses/.

[13] Kalita, (2016, July 31), *op. cit.*

[14] Samudra Gupta Kashyap and Halliday, (2015, July 2), *op. cit.*

[15] *Ibid.*

[16] Whilst I was in Imphal, a bomb exploded outside an army barracks, which led to a heightened police and army presence on the streets of the city.

groups".[17] This will make railway construction difficult. In July 2016, the then Minister of Railways, Mr Suresh Prabhu, gave his assurance that the line would be extended to Moreh, at an estimated cost of Rs 9,000 crore or about US$1.4 billion.[18] The new line from Jiribam to Imphal and Moreh will be a broad-gauge line, which means there will be break-of-gauge issues if the line continues over the border with Burma to Tamu and then on to Kalaymyo to link with the Myanma Railways network. Hopefully Kalaymyo will be reconnected to the main network by the time the Tamu-Kalaymyo line is built.[19] The construction time of the Jiribam-Tupul-Imphal line will be eleven years from the time it was first launched in 2008 to possible completion in 2019. Based on that construction time, a line from Imphal to Moreh will take several years to build. Moreh is 109 kilometres by road from Imphal, and survey work has commenced on the line between the two cities.[20] There has been pressure for the Jiribam-Imphal line to be built, as Imphal is the capital of Manipur. Moreh is of much less importance, and in spite of the assurances given by the Minister of Railways in mid-2016, a line from Imphal to Moreh will only be built if a rail line between India and Burma is likely. There were plans for a bus service between Imphal and Mandalay, with a trial run being conducted in December 2015.[21] The distance between the two cities is 580

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[17] Purkayastha, Samir, (2016, August 1), "India plans Myanmar rail connection", Mizzima. Retrieved from: http://www.mizzima.com/news-regional/india-plans-myanmar-rail-connection; and

Bhaumik, Subir, (2016, March 28), "Insurgent threats pushes Manipur rail project way behind schedule", Business Standard. Retrieved from: http://www.business-standard.com/article/news-ians/insurgent-threats-pushes-manipur-rail-project-way-behind-schedule-116032800465_1.html.

[18] *The Telegraph India*, (2016, July 30), "Assurance on Moreh link". Retrieved from: https://www.telegraphindia.com/1160731/jsp/northeast/story_99706.jsp.

One crore is ten million rupees, so Rs 9,000 crore is 90 billion rupees. At an exchange rate of 65 rupees per US dollar this equates to US$1.38 billion. Taking the approximate length of the railway from Imphal to Moreh as 109 *km*, this is a cost of US$12.7 million per kilometre. This compares to the cost of US$5.6 million per kilometre for the railway recently built in Kenya, as discussed in Chapter 4. The higher cost in India would reflect the difficulty of the terrain in Manipur. See:

Kacungira, (2017, June 8), *op. cit.*

[19] This connection could be to Pakokku via Gangaw once the break in the line due to the collapsed Ponnya Taung Railway Tunnel is addressed; or to Monywa which is linked to Mandalay by rail.

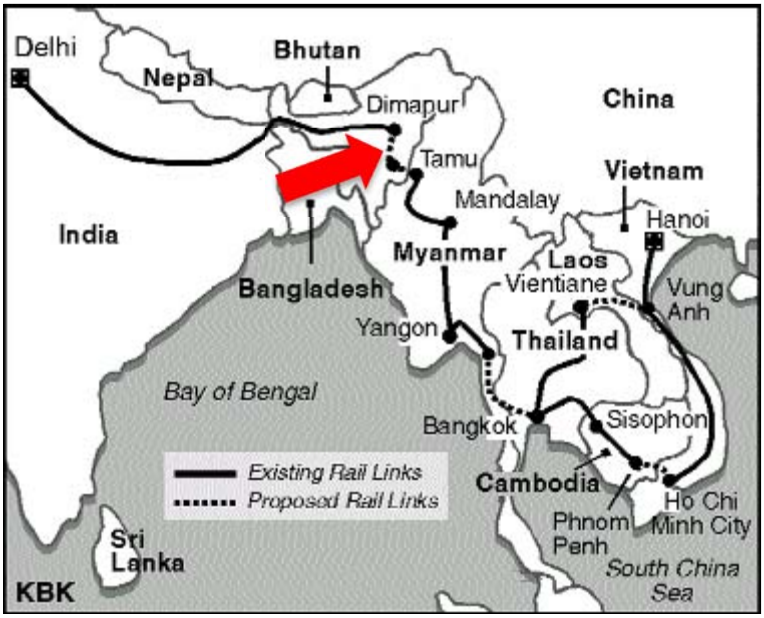
[20] *The Sangai Express*, (2016, November 1), *op. cit*.

[21] Singh, M. Lakshmikumar, (2016, March 6), "Imphal-Mandalay Bus Service a dream come true", E-Pao website. Retrieved from: http://www.e-pao.net/epSubPageExtractor.asp?src=travel.Manipur_Travel_Log.Imphal_Mandalay_Bus_Service_a_dream_come_true_By_M_Lakshmikumar; and

Nehginpao Kipgen, (2016, August 27), "India should seize opportunity of Htin Kyaw visit", Bangkok Post. Retrieved from: http://www.bangkokpost.com/opinion/opinion/1071976/india-should-seize-opportunity-of-htin-kyaw-visit.

kilometres. This service has not been resumed due to poor road conditions around the border area.[22]

The construction of a rail line from Burma to India is probably twenty or more years away, but it is raised in reports and feasibility studies from time to time, especially in the context of the Trans-Asian Railway. RITES Ltd (a public sector engineering consultancy enterprise under the Indian Ministry of Railways) conducted a feasibility study of the route in 2013.[23] Map 29 below shows how the proposed link between Tamu in Burma and Dimapur in India is a part of the connectivity planned with the Trans-Asian Railway.[24]



Map 29: The rail link between Dimapur and Tamu.

A more detailed map of the proposed route inside Burma is shown in Map 30 below.[25] This map is taken from a formal presentation by the former Ministry of Rail Transportation in 2015 and repeated in a presentation by Myanma Railways

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[22] *The Economic Times*, (2016, January 8), "Imphal-Mandalay bus service hits infrastructure roadblock". Retrieved from: http://economictimes.indiatimes.com/news/politics-and-nation/imphal-mandalay-bus-service-hits-infrastructure-roadblock/articleshow/50495220.cms; and

Nehginpao Kipgen, (2016, August 27), *op. cit.*

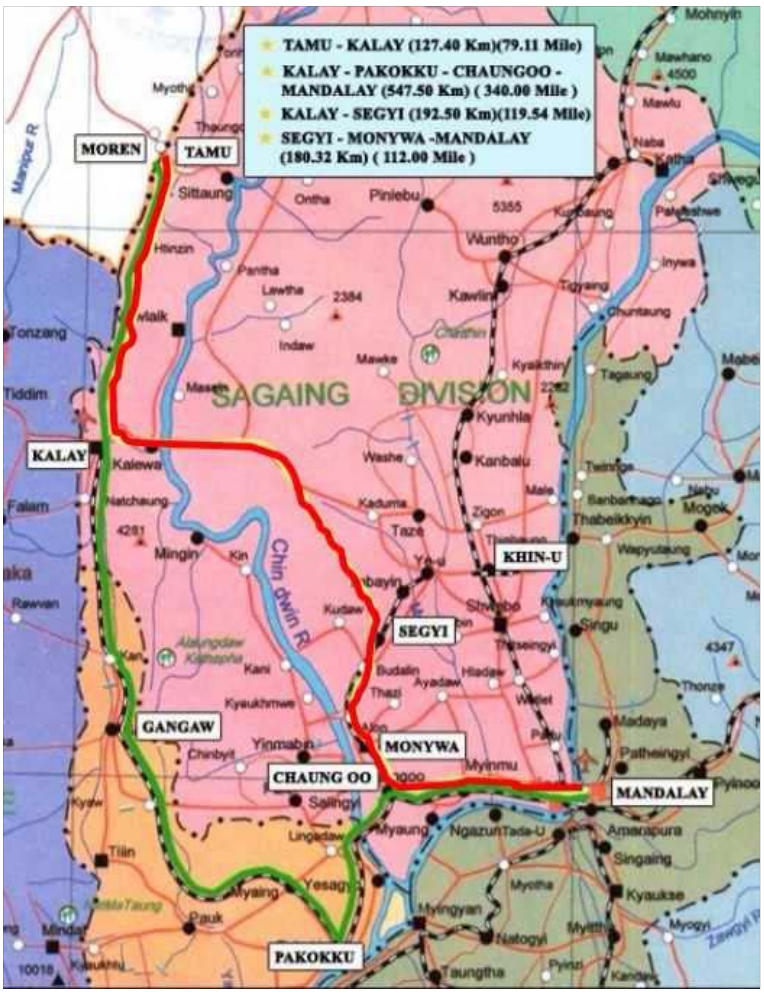
[23] Bhaskar, (2013, June 11), *op. cit*.

[24] *Railnews*, (2013, June 11), "India-Myanmar Rail Link Possible". Retrieved from: http://www.railnews.co.in/japan-completes-feasibility-study-of-myanmar-rail-project/.

Note that this map shows a rail line from Mandalay to Tamu. This is incorrect: it goes from Mandalay to Monywa, and then goes north to Segyi before heading north-east to Ye-u and Khin-U.

[25] *Ministry of Rail Transportation*, (2015, November 23), *op. cit*.

in February 2017, which may suggest that a rail link to India is still on the agenda for Myanma Railways.[26]



Map 30: The possible route of the India-Burma Railway once inside Burma.

Once the line reaches Kalaymyo it may either run south through Gangaw to Pakokku and then via Chaung U to Mandalay (the green line) or alternatively swing south-east to join the existing network at Segyi before continuing on to Monywa and Mandalay (the red line). Segyi is on the line currently in use between Monywa and Khin-U. Myanma Railways listed these two options in a presentation to a joint UNESCAP-OSJD meeting in New Delhi in March 2017:[27]

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[26] *Myanma Railways,* (2017, February), "Myanmar Presentation". Retrieved from: http://www.tistr.or.th/asean_next_2017/files/Myammar%20Presentation.pdf.

[27] *Ministry of Transport and Communications,* (2017, March 15), "Current Status and Challenges to Facilitation of International Railway Transport in Myanmar". A presentation to The Joint ESCAP-OSJD Meeting on Strengthening Railway Transport Connectivity in South and Southwest Asia. Retrieved from: http://www.unescap.org/sites/default/files/2.5_Myanmar.pdf.

ESCAP stands for "Economic and Social Commission for Asia and the Pacific", also known as UNESCAP.

OSJD is the Organization for Co-operation between Railways.

- **Option 1**: Tamu-Kalaymyo (new line) and Kalaymyo-Gangaw-Pakokku-Chaung U-Mandalay (existing line).
- **Option 2**: Tamu-Kalaymyo (new line); Kalaymyo-Kalewa-Segyi-Monywa (new line); and Monywa-Chaung U-Mandalay (existing line).

Myanma Railways indicated that its preferred route is Option 2, via Segyi. The sections of the line between Tamu and Mandalay are shown in Table 59 below.

Line	Length (Miles)
Tamu - Kalaymyo	79
Kalaymyo - Segyi	120
Segyi - Monywa - Mandalay	112
	311

Table 59: The sections of a line from Tamu to Mandalay via Segyi.

Myanma Railways has indicated that the existing metre-gauge line from Monywa to Mandalay would be used, so therefore any new line from Tamu to Kalaymyo to Segyi would also be metre gauge.

In October 2016 when Aung San Suu Kyi visited India on a State Visit in her capacity of State Counsellor, the two countries issued a joint statement, one point of which was to hold early meetings of the Joint Working Groups on Railways and Shipping.[28] This suggests that a rail link between India and Burma, crossing between the two countries near Tamu and Moreh, remains on the agenda for future discussion.

In another recent development, the governments of India and Burma are planning to open a new border gate at Tamu (in Burma) which is across the border from Moreh in India.[29] At the moment local residents can cross the border on day passes. But this move, which was expected to happen in early 2017, will allow pilgrims, traders and holidaymakers to cross between the two countries. While this

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[28] *The Global New Light of Myanmar,* (2016, October 20), "Joint Statement issued on the occasion of the State Visit of the State Counsellor of the Republic of the Union of Myanmar to the Republic of India". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2016-10-20-red.pdf; and

The Irrawaddy, (2016, October 17), "Daw Aung San Suu Kyi Goes to India". Retrieved from: http://www.irrawaddy.com/opinion/editorial/daw-aung-san-suu-kyi-goes-to-india.html; and

Shoon Naing, (2016, October 19), "State Counsellor meets Indian PM, other leaders at India forums", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/national-news/23180-state-counsellor-meets-indian-pm-other-leaders-at-india-forums.html.

[29] Pyae Thet Phyo and Ei Ei Thu, (2016, November 30), "Myanmar and India to open new international border gate in Tamu", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/national-news/23963-myanmar-and-india-to-open-new-international-border-gate-in-tamu.html.

will have no bearing on any imminent rail connection between the India and Burma, it will certainly improve commercial and tourist relations between the two countries.

8.3 Long-term Plans for a Railway from Bangladesh to Burma

Bangladesh is building a new railway to Cox's Bazar, which is very close to its border with Burma.[30] After several years of delay, construction of this railway is scheduled to begin in August 2017.[31] It will be a dual-gauge track with a scheduled completion date of 2022, with the track being 100 kilometres in length. The track was initially intended to be a metre-gauge one, but a decision was made in 2014 to make it dual gauge, the two gauges being metre gauge and Indian broad gauge (1,676 *mm*).[32]

Dr M. Rahmatullah, the former Transport Director of UNESCAP in Bangkok, has examined the opportunities for Bangladesh to be a transport hub, particularly for India and Nepal, but also for Burma.[33] The Bangladeshi government hopes to extend the line to the border with Burma, crossing into Burma at Gundam which is in Rakhine State, to eventually link with the Myanma Railways network.[34] The Bangladeshi government has not finalised this link from Cox's Bazar to Gundam. It will be many years off, and needs the political situation in Rakhine State to

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[30] *The Daily Star*, (2011, April 3), "PM opens Cox's Bazar connection works". Retrieved from: http://www.thedailystar.net/newDesign/latest_news.php?nid=29190.

[31] Mamun, Shohel, (2017, April 8), "Chittagong-Cox's Bazar rail route construction to begin in August", Dhaka Tribune. Retrieved from: http://www.dhakatribune.com/bangladesh/development/2017/04/08/chittagong-coxs-bazar-rail-route-construction-begin-august/; and

Dhaka Tribune, (2017, June 17), "$300m loan deal from Chittagong-Cox's Bazar on June 21". Retrieved from: http://www.dhakatribune.com/bangladesh/development/2017/06/17/300m-loan-deal-chittagong-coxsbazar-railway/; and

Technical Tv, (2017, May 7), "Chittagong to Cox's Bazar rail line | Chittagong Cox's Bazar Gundum Railway Project of Bangladesh". A video recording on YouTube. Retrieved from: https://www.youtube.com/watch?v=IfGxlEu0Tv8.

[32] *Railway Gazette,* (2016, September 28), *op. cit.;* and

Railway Technology.com website, "Chittagong-Cox's Bazar Railway Line, Bangladesh". Retrieved from: http://www.railway-technology.com/projects/chittagong-coxs-bazar-railway-line.

A photograph on this website shows the proposed dual-gauge line with four rails: the two outer ones being 1,676 *mm* apart and the two inner ones 1,000 *mm* apart.

[33] Rahmatullah, M., (2009), "Regional Connectivity: Opportunities for Bangladesh to be a Transport Hub", Journal of Bangladesh Institute of Planners, Vol. 2, December 2009, pp.13-29.

[34] Mamun, (2017, April 8), *op. cit.*; and

Dhaka Tribune, (2017, June 17), *op. cit*.

stabilise and for Myanma Railways to build a railway there to link to this proposed link with Bangladesh.

8.4 A Possible Railway from Dawei to Thailand

A major deep-sea port and industrial estate are planned at Dawei in the south of Burma, on the Tenasserim Coast. A railway from Dawei to Kanchanaburi in Thailand is a part of the project.

8.4.1 The Dawei Project

Construction of the deep-sea port at Dawei has started. A Thai company, Italian-Thai Development PCL, signed a US$8 billion contract in late 2010 for the development of the port.[35] The Myanmar government hopes to establish a special economic zone at Dawei, similar to the Special Economic Zone at Shenzhen in China.[36] There are plans to build a deep-sea port including shipbuilding and maintenance facilities, warehouses, factories, oil storage silos as well as a refinery and a petrochemical processing plant.[37] There are doubts already about whether the project will go ahead, because of concerns about electricity supply.[38] A planned coal-fired power station with a generating capacity of 4,000-megawatt was cancelled in 2012.[39] By 2014 a 500-megawatt gas-powered plant was approved by the Ministry of Energy. Rights groups and environmentalists have expressed concern about the Dawei project over the years.[40]

Thailand has changed its port strategy, emphasising its own ports such as the one at Laem Chambang to be a maritime gateway for the upper ASEAN

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[35] *Mizzima,* (2010, November 10), "Thai engineering giant signs Tavoy port deal". Retrieved from: http://archive-2.mizzima.com/business/4563-thai-engineering-giant-signs-tavoy-port-deal.html.

"PCL" stands for Public Co., Ltd.

[36] Htet Aung, (2011, January 15), "Will Tavoy be Burma's Shenzhen?" The Irrawaddy. Retrieved from: http://www2.irrawaddy.org/article.php?art_id=20531.

[37] Boot, William, (2010, November 4), "Thai Firm to Build New Burmese Port", The Irrawaddy. Retrieved from: http://www2.irrawaddy.org/article.php?art_id=19940.

[38] Boot, William, (2012, February 25), "Tavoy Project in Limbo with Electricity Supply in Doubt", The Irrawaddy. Retrieved from: http://www2.irrawaddy.org/print_article.php?art_id=23097.

[39] *Democratic Voice of Burma*, (2012, January 10), "Burma cancels huge Tavoy project". Retrieved from: http://www.dvb.no/news/burma-cancels-huge-tavoy-power-plant/19539.

[40] See for example:

Lawi Weng, (2011, December 20), "Thai PM Visit Stirs Tavoy Voices", The Irrawaddy. Retrieved from: http://www2.irrawaddy.org/article.php?art_id=22686.

countries.[41] This could put an end to Thailand's plan to use Dawei in southern Burma. A railway is a part of the Dawei proposal, running from Dawei to Kanchanaburi in Thailand to join the State Railway of Thailand's network. But clearly it depends on the port strategy that Thailand chooses to follow.

In March 2017 the Dawei Special Economic Zone (SEZ) was considered to be back on track after many fits and starts.[42] The company Italian-Thai Development PCL withdrew from the agreement to build the SEZ in 2013 citing financial difficulties, and resigned from the concession in 2015. But a new consortium has been formed, and includes Italian-Thai Development PCL, a Japanese-Thai joint venture company Rojana Industrial Park PCL and a Thai company LNG Plus International Co., Ltd. The government of Burma has set up a high-level committee and task force to restart the Dawei SEZ, which has been stalled for several years. The committee is chaired by Vice-President U Henry Van Thio and has various government ministers as members. The task force is chaired by the Minister of Commerce. It is not the purpose of this thesis to delve into the financial and political issues of the Dawei SEZ. But certainly it looks like it will go ahead with a highway linking Dawei to the Greater Mekong Subregion and a deep-sea port at Dawei to link Thailand, Vietnam and Cambodia with the Middle East, India and Africa, eliminating the need to ship goods through the Straits of Malacca. If both the highway and deep-sea port eventuate, it is highly likely that a rail link between Dawei and Kanchanaburi will be built.

8.4.2 Proposals for a Railway from Burma to Thailand

One of the proposed routes for a railway is a standard-gauge line from Dawei to Kanchanaburi in Thailand, from where lines will continue on to Cambodia and Vietnam. This line is shown in Map 31.[43]

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[41] Boot, William, (2012, March 9), "Dawei Port in Doubt with Bangkok Hub Plan", The Irrawaddy. Retrieved from: http://www2.irrawaddy.org/opinion_story.php?art_id=23176; and

Port Strategy, (2012, March 8), "Thailand sports new ports strategy". Retrieved from: http://www.portstrategy.com/news101/world/asia/thailand-ports-new-strategy; and

Sukmanop, (2012, February 29), *op. cit.*

[42] *The Global New Light of Myanmar,* (2017, March 3), "Dawei SEZ project back on track". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-03-03-red.pdf; and

The Irrawaddy, (2017, March 4), "Long-stalled Dawei SEZ Gets New Committee". Retrieved from: https://www.irrawaddy.com/business/business-roundup-march-4.html.

[43] Fernquest, (2015, January 28), *op. cit.*

Map 31: The proposed route of the railway from Dawei to Cambodia and Vietnam.

Another route from Burma to Thailand that has been proposed is one that follows the route of the infamous Thai-Burma Railway from World War II, from Thanbyuzayat in Burma to Namtok in Thailand.[44] The Korea International Cooperation Agency (KOICA) conducted a feasibility study from 2005 to 2007, with the line being seen as a spur line on the Singapore-Kunming Rail Link Project. This route is shown in Map 32 below.[45]

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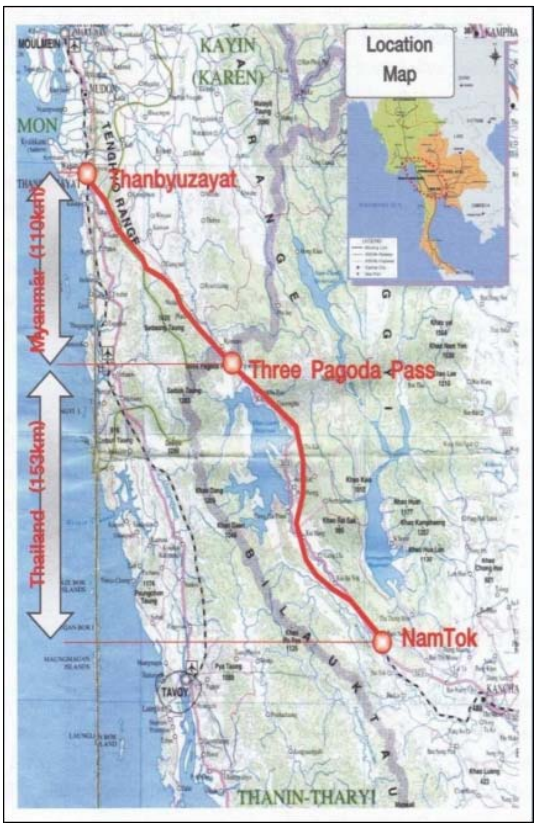
[44] *Ministry of Rail Transportation*, (2015, November 23), *op. cit*., and

Xinhua News Agency, (2006, September 28), "Myanmar-Thai Railroad Feasibility Study Finalised". Retrieved from: http://www.china.org.cn/english/travel/182536.htm.

Namtok is linked to Kanchanaburi by rail, with a line going from Kanchanaburi to Thonburi in Bangkok.

[45] *Myanma Railways*, (2017, February), *op. cit*.



Map 32: The proposed route from Thanbyuzayat to Namtok, following the route of the infamous Thai-Burma Railway from World War II.

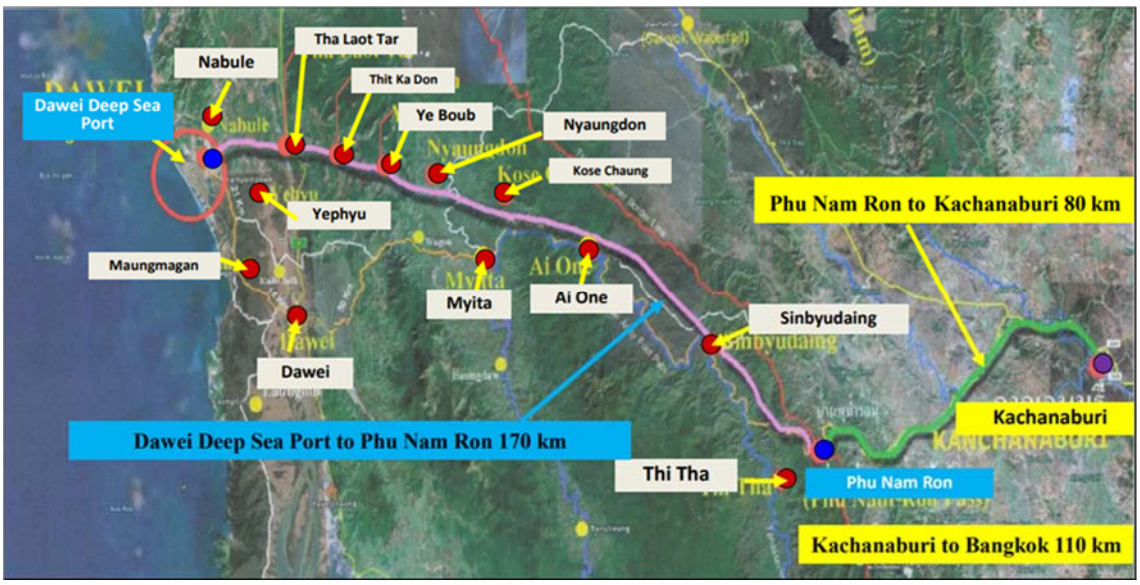
But due to the mountainous terrain, high construction costs and low projected passenger numbers, the plan was shelved in 2012 in favour of a link from Dawei to Kanchanaburi.[46]

The line running south from Yangon to Dawei, via Moulmein and Ye is badly in need of an upgrade.[47] If a line is built from Dawei to Thailand, it will be to service the new port and Special Economic Zone being built at Dawei, not to provide a conduit for rail traffic from Yangon into Thailand. The line from Dawei to Thailand is on Myanma Railways' "wish list", as indicated by its inclusion in presentations in 2015 and 2017 and the request by Myanma Railways to the Japanese Ministry of Land, Infrastructure, Transport and Tourism (MLIT) to carry out a feasibility study of the route from the Dawei deep-sea port to Phu Nam Ron on the border with

[46] *Ministry of Rail Transportation*, (2015, November 23), *op. cit*.

[47] I have travelled on this line to and from Dawei on two occasions, the last time being in January 2017.

Thailand.[48] The possible route from Dawei to Phu Nam Ron is shown in Map 33 below.[49]



Map 33: The route of the proposed railway from Dawei to Phu Nam Ron.

A line from Dawei to Kanchanaburi is of low priority compared to the upgrading of the Yangon-Mandalay line and the improvement of the Circular Railway in Yangon.

8.5 The Importance to the Railways of Peace in Burma

It is clear that political issues are becoming very relevant to the likelihood of international rail links for Burma, as well as construction of internal lines such as the Shan State Railway. Peace with rebel ethnic groups is desirable if major international rail projects, especially to China but also to India and Thailand, are to go ahead without their construction and operation being disrupted by internal conflict. There is a possibility that peace may eventually be achieved, as on 31st March 2015 a draft agreement between the former military government and sixteen rebel groups was signed in Nya Pyi Taw, witnessed by President U Thein Sein.[50] However representatives of the rebel group in the Kokang Region were

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[48] *Ministry of Rail Transportation*, (2015, November 23), *op. cit*.; and

Myanma Railways, (2017, February), *op. cit*.; and

Ministry of Transport and Communications, (2017, March 15), *op. cit*.

[49] *Myanma Railways*, (2017, February), *op. cit*.

[50] *BBC News*, (2015, March 31), "Myanmar army and rebels sign draft ceasefire agreement". Retrieved from: http://www.bbc.com/news/world-asia-32126918; and

Kyaw Myo Tun and Lawi Weng, (2015, March 31), "President Attends Ceremony Where Govt, Rebels Signal Support for Draft Nationwide Ceasefire", The Irrawaddy. Retrieved from:

not a party to the agreement. The United Nations issued a statement underlying the significance of this draft agreement:[51]

> *For the government of Myanmar and 16 Ethnic Armed Groups to reach a ceasefire agreement after more than sixty years of conflict is a historic and significant achievement. The United Nations welcomes this milestone in Myanmar's history.*

The government is seeing this draft agreement as the "*Second Panglong Victory*", a reference to the Panglong Agreement negotiated in February 1947 between Aung San (heading the interim Burmese Government) and representatives of the Shan, Kachin and Chin peoples.[52] It is only a draft agreement, and reaching a final agreement will involve political dialogue, which may well take years. A key issue will be whether the ethnic armies will be required to disarm or not.[53] For the China-Burma Railway (if it is ever to go ahead), the absence of the Kokang rebel group from this current agreement is significant. Time will tell if this draft ceasefire agreement will lead to a final agreement and to a level of peace not known in Burma for decades.

The next major step was the Union Peace Conference (dubbed the 21st Century Panglong Conference) which took place from 31st August to 3rd September 2016 in Nay Pyi Taw.[54] It is planned to hold peace conferences every six months. Participants at the first conference:[55]

> *acknowledged that the current conference was only an 'introduction' to peace negotiations, which they believed could span three to five years.*

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http://www.irrawaddy.org/multimedia-burma/president-attends-ceremony-where-govt-rebels-signal-support-for-draft-nationwide-ceasefire.html.

[51] *United Nations Information Centre Yangon*, (2015, March 31), "Statement on behalf of Special Adviser Vijay Nambiar". Retrieved from: http://yangon.sites.unicnetwork.org/2015/03/31/statement-on-behalf-of-special-adviser-vijay-nambiar-2/.

[52] *The Global New Light of Myanmar*, (2015, April 1), "President U Thein Sein witnesses signing of draft nationwide ceasefire agreement in Yangon". Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-04-01-red.pdf; and

Cady, John F., (1958), "A History of Modern Burma", Cornell University Press, Ithaca, New York, pp. 543-544.

[53] Lawi Weng, (2015, April 1), "Disagreements Signal Long Road Ahead for Nationwide Peace", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/burma/disagreements-signal-long-road-ahead-for-nationwide-peace.html.

[54] *The Global New Light of Myanmar*, (2016, September 4), "The Heart of the Nation. State Counsellor calls for constant efforts to keep up momentum for peace and reconciliation". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2016-09-04-red.pdf; and

Nyein Nyein, (2016, September 3), "State Counselor Tells Peace Conference Participants Not to Dwell on the Past", The Irrawaddy. Retrieved from: http://www.irrawaddy.com/burma/state-counselor-tells-peace-conference-participants-not-to-dwell-on-the-past.html.

[55] Nyein Nyein, (2016, September 3), *op. cit.*

Also crucial is the relationship between the NLD government and the military. It appears that a working relationship is developing between Aung San Suu Kyi and the country's military commander, General Min Aung Hlaing.[56] A leading journalist, Larry Jagan, commented:[57]

> *So instead of being rivals, as they have been since 1988, the Lady and the general's emerging partnership may lead to the current political stasis being unblocked, and allow the new government to implement its vision of the future.*

Various ethnic groups are holding off from signing the government's ceasefire agreement.[58] In Manipur in India, insurgency problems have impacted on the construction of the railway from Jiribam to Imphal, as discussed in §8.2 above. Unless a way to peace is found in Burma, similar disruption will occur in Shan State if an attempt is made to construct the China-Burma Railway or the Shan State Railway.

8.6 Upgrading the Yangon to Mandalay Line

The line from Yangon to Mandalay is Myanma Railways' premier line, and not surprisingly there are plans to improve it, primarily to shorten the length of the journey. When I travelled from Rangoon to Mandalay in 1975 the trip took fourteen hours. Forty-two years later, it still takes fourteen hours. There is much room for improvement.[59]

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[56] Aung Zaw, (2016, July 25), "The Lady and the Generals", The Irrawaddy. Retrieved from: http://www.irrawaddy.com/commentary/the-lady-and-the-generals.html.

[57] Jagan, Larry, (2016, July 24), "Myanmar's Lady cosies up to the General", BBC News. Retrieved from: http://www.bbc.com/news/world-asia-36867412.

[58] Nyein Nyein, (2016, November 11), "Ethnic Alliance Holds Off on Signing Ceasefire Agreement", The Irrawaddy. Retrieved from: https://www.irrawaddy.com/news/burma/ethnic-alliance-holds-off-on-signing-ceasefire-agreement.html; and

Radio Free Asia, (2017, February 24), "Ethnic Militias Decide Not to Sign Myanmar Government's Ceasefire Agreement". Retrieved from: http://www.rfa.org/english/news/myanmar/ethnic-militias-decide-not-to-sign-myanmar-governments-ceasefire-agreement-02242017145929.html; and

International Crisis Group, (2017, June 29), "Building Critical Mass for Peace in Myanmar", Report N° 287. Retrieved from: https://www.crisisgroup.org/asia/south-east-asia/myanmar/287-building-critical-mass-peace-myanmar; and

Lun Min Mang, (2017, July 3), "Three challenges loom for next Panglong conference: ICG report", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/national-news/26638-three-icg.html.

[59] In November 1922 George Orwell, serving as a police officer in Burma, travelled by train with a fellow trainee from Rangoon to the Burma Provincial Police Training School in Mandalay. It was a sixteen-hour journey. See:

Crick, Bernard, (1980), "George Orwell: A Life", Secker & Warburg, London, p.79.

In May 2016 Myanma Railways announced that it would put out a tender for private companies to upgrade the Yangon-Mandalay line. In May 2016 the tender was valued at about US$2.0-2.2 billion, but by December 2016 the figure had been reduced to US$1.7 billion.[60] The tenders to upgrade the line opened for bids in Japan in early 2017, with the aim of inviting experienced Japanese companies to upgrade the track to an international standard.[61] The upgrade will be funded by a soft-dollar loan from Japan. Myanma Railways is working closely with the Japan International Cooperation Agency (JICA) on the upgrades, which in mid-2016 were expected to take until 2023 to complete, but are now expected to be completed by the 2019-2020 fiscal year.[62] Only Myanmar-Japan joint companies will be allowed to participate in the tenders for the upgrade of this line.[63] It is hoped to reduce the Yangon-Mandalay trip to just eight hours, which would be a significant improvement on the target of twelve hours put forward in November 2015.[64] The first stage of the project will start in 2017, with an upgrade of the Yangon-Toungoo line, which is estimated to cost US$200 million.[65] The second phase will be between Toungoo and Yamaethin, and the third phase between Yamaethin and Mandalay.[66] Work is already under way to upgrade the signalling system between

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[60] Thein Ko Lwin, (2016, May 24), "Myanma Railways to put Yangon-Mandalay rail upgrade out to tender", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs22/GNLM2016-05-24-red.pdf; and

Lewis, Simon, (2016, May 28), "Myanma Railways to Tender $2.2b Upgrade", The Irrawaddy. Retrieved from: http://www.irrawaddy.com/business/the-irrawaddy-business-roundup-may-28-2016.html; and

Swan Ye Htit, "(2016, May 24), "Tender planned for $2b Yangon-Mandalay railway upgrade", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/business/20469-tender-planned-for-2b-yangon-mandalay-railway-upgrade.html; and

Aung Thant Khine, (2016, August 25), "Railroad upgrade to reduce Yangon-Mandalay travel time by 2023", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs23/GNLM2016-08-25-red.pdf; and

The Global New Light of Myanmar, (2016, December 5), "Yangon-Mandalay railway upgrading to be put out for bids in Japan". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2016-12-05-red.pdf.

[61] *The Global New Light of Myanmar*, (2016, December 5), *op. cit*.

[62] Aung Thant Khine, (2016, August 25), *op. cit*.; and

The Global New Light of Myanmar, (2016, December 5), *op. cit*.; and

Japan International Cooperation Agency, (2016, July 14), "The Yangon-Mandalay Railway Improvement Project in Myanmar". A video recording on YouTube. Retrieved from: https://www.youtube.com/watch?v=-zXTUkogvNY.

[63] Aung Thant Khine, (2016, August 25), *op. cit*.

[64] Soe Win, (2015, November 4), *op. cit.*

[65] *The Global New Light of Myanmar*, (2016, December 5), *op. cit*.

[66] Aung Thant Khine, (2016, August 25), *op. cit*.; and

The Global New Light of Myanmar, (2016, December 5), *op. cit*.

Yangon and Pyuntaza. This work is being undertaken by two Japanese companies, Mitsubishi Corporation and Hitachi, as part of a 2.4 billion yen contract signed in 2015 and will be covered by grant aid from JICA. This project to upgrade the signalling system was due for completion by June 2017.[67] The overall upgrade of the Yangon-Mandalay line is scheduled to be completed by the 2019-2020 fiscal year, as indicated above.[68] The 2.4 billion yen loan is just a part of loans totalling 100 billion Yen (about US$995 million) that Japan is offering for infrastructure in Burma.[69] These are the first loans Japan has offered since Aung San Suu Kyi took office. The view from Japan is:[70]

> *Japan is eager to give assistance to Myanmar as a way to counter China's influence in the fast-growing and resource-rich country.*

This rivalry between China and Japan should be beneficial to enterprises such as Myanma Railways. The completion dates and costs outlined above are bound to change as time goes along.

In conjunction with the upgrade of the track and signalling equipment, the rolling stock is being upgraded. A new "Chinese train" with carriages and locomotives manufactured in China is operating on the Yangon to Mandalay route. This train is shown in Plate 18 in Chapter 3. In December 2016 Myanma Railways put out a tender invitation for the supply of four train sets of six cars each, with the cars to be Diesel Electric Multiple Units (DEMU's), to be used on the Yangon to Mandalay line.[71] The introduction of DEMU's on the Yangon-Mandalay line will

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[67] *Mitsubishi Corporation*, (2015, May 18), "Mitsubishi Corporation and Hitachi Ltd. To Supply and Install Train Signalling Systems in Myanmar". Retrieved from: http://www.mitsubishicorp.com/jp/en/pr/archive/2015/html/0000027555.html.

[68] *The Global New Light of Myanmar*, (2016, December 5), *op. cit*.

[69] *Kyodo News*, (2016, August 26), "Japan plans to offer Myanmar 100 billion yen in loans", Bangkok Post. Retrieved from: http://www.bangkokpost.com/news/asia/1071445/japan-to-offer-myanmar-%C2%A5100bn-in-loans; and

Htoo Thant, (2016, December 7), "MPs to mull Japan's soft loan offer", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/national-news/yangon/24074-mps-to-mull-japan-s-soft-loan-offer.html.

The loan announced in December 2016 will have an interest rate of only 0.01% with a10-year period of grace followed by a 30-year repayment period. At such a low interest rate it costs only US$100 to borrow US$1 million for one year.

[70] *Kyodo News*, (2016, August 26), *op. cit.*

[71] *The Global New Light of Myanmar*, (2016, December 9), "Invitation for Bids", p.13. Retrieved from: http://www.burmalibrary.org/docs23/GNLM2016-12-09-red.pdf; and

The Global New Light of Myanmar, (2016, December 9), "Invitation for Prequalification", p.13. Retrieved from: http://www.burmalibrary.org/docs23/GNLM2016-12-09-red.pdf; and

represent a significant step in modernising the type of service Myanma Railways currently offers on this line.

An upgrade of the Yangon to Mandalay line is very important in the context of Myanma Railways, as it is the premier line in the country. One trigger for an increase in passenger traffic could be the improved service offered by the new Chinese train for the No. 5 Up and No. 6 Down services on the main line. An upgraded main line will also be beneficial to Myanma Railways' freight business.

8.7 The Line from Mandalay to Myitkyina

Myanma Railways has a line operating from Mandalay to Myitkyina, the capital of Kachin State. Myitkyina is 722¾ miles by rail from Yangon, and just over 332 miles from where the rail line crosses the Irrawaddy River at Sagaing. The journey by train from Mandalay to Myitkyina has been described by the journalist Simon Roughneen as follows:[72]

> *Currently the Mandalay-Myitkyina train journey can take up to 24 hours, a 400-mile, stop-start countryside crawl with goods-laden passengers jumping on and off along the way.*

I travelled from Mandalay to Myitkyina by rail on 30th January 2010, departing Mandalay at 12:00 noon, and arriving at Myitkyina the next morning at 8:00am, so a twenty-hour trip, averaging about 18 miles per hour.[73] The description by Simon Roughneen is very apt. The line from Mandalay to Myitkyina has been in the news in recent years for good and bad reasons: the bad are the frequent derailments and accidents; the good is the fact that the government is putting funds into the line to improve it. Recent funding initiatives for the Mandalay-Myitkyina line may reflect a desire of the NLD government in Nay Pyi Taw to be seen to be improving

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Matsui, Motokazu, (2016, December 10), "Myanmar opens bidding for new Yangon-Mandalay rail cars", Nikkei Asian Review. Retrieved from: http://asia.nikkei.com/Business/Deals/Myanmar-opens-bidding-for-new-Yangon-Mandalay-rail-cars.

A DEMU is a type of DMU (Diesel Multiple Unit). For example, a DMU may be further classifies by its type of transmission, in this case diesel-electric.

[72] Roughneen, Simon, (2013, December 11), "Burma Govt Hopes for Rangoon-Myitkyina Rail Upgrade, The Irrawaddy. Retrieved from: https://www.irrawaddy.com/news/burma/burma-govt-hopes-rangoon-myitkyina-rail-upgrade.html.

[73] I made this trip again on 20th January 2018. The No. 57 Up service departed from Myitkyina at 9:00am, and was scheduled to arrive the next day in Myitkyina at 5:40am. It arrived at 6:15am, so it was a 21¼-hour trip.

the infrastructure to Kachin State, which is a much-troubled state at present with ethnic unrest and fighting dominating the news from the region.[74]

The line has had its share of troubles over the years. During World War II it was heavily strafed and bombed, as was the rest of the Burma Railways network.[75] On 30th December 1994 102 people were killed and another 53 injured when a train's brakes failed and it ran out of control near Wuntho Township, about 135 miles north of Mandalay.[76] It was the deadliest train accident in Burma's history and saw one carriage plunge into a ravine and another left hanging from a bridge. On 9th November 2012 a train carrying petrol and diesel derailed near Kanbalu and burst into flames, killing at least 25 people and injuring 93 other people.[77] Many of the dead and injured were villagers collecting spilt fuel. In early January 2016 a goods train derailed between Naba and Indaw stations, with no injuries but there was a major disruption to passenger services.[78] Naba and Indaw were the site of another accident eight months later, when on 24th September 2016 a Myitkyina-bound train derailed at a bridge between Naba and Indaw stations, leaving the locomotive hanging over the edge of the bridge.[79] Two drivers were injured. A week later a goods train derailed near Wuntho Township, with no reported injuries.[80] On 22nd March 2017 Kanbalu was back in the news, with two passenger trains colliding head-on near Leik Htoo village near Kanbalu. The trains were the No. 42 Down and No. 41 Up services. The No. 41 Up service travelling from Mandalay to Myitkyina failed to stop at Kanbalu Railway Station and subsequently

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[74] See, for example:

Lawi Weng, (2016, July 26), "Ethnic Armed Group Summit Commences in Kachin State", The Irrawaddy. Retrieved from: https://www.irrawaddy.com/news/burma/ethnic-armed-group-summit-commences-in-kachin-state.html.

[75] See, for example:

Thomas, Lowell, (1952), "Back to Mandalay", Shakespeare Head, London, p.221.

[76] *Los Angeles Times*, (1995, January 1), "102 Killed as Train Derails in Myanmar". Retrieved from: http://articles.latimes.com/1995-01-01/news/mn-15376_1_train-myanmar-derails.

[77] *ABC News*, (2012, November 10), "25 dead in Burma train fire". Retrieved from: http://www.abc.net.au/news/2012-11-10/an-burma-train-fire/4364586.

[78] Maung Chit Lin, (2016, January 10), *op. cit.*

The article refers to the station as "Nabar", but town is usually known as "Naba", and is where the branch line from Katha joins the main line.

[79] Aung Thant Khaing, (2016, September 25), *op. cit*.

[80] Maung Chit Lin, (2016, September 28), *op. cit.*

crashed into the No. 42 Down service, travelling from Myitkyina to Mandalay.[81] Both locomotives were damaged but surprisingly there was no report of injury. The evidence is quite clear: in addition to deaths and injuries these accidents are causing major delays to other trains on the line.

There are moves afoot to upgrade the line. In December 2013 Myanma Railways announced plans to upgrade this line, in conjunction with the upgrading of the Yangon to Mandalay line.[82] A review of the performance of the Ministry of Transport and Communications during the first year of the NLD government appeared in the government-owned newspaper *The Global New Light of Myanmar* in March 2017.[83] The review referred to how Myanma Railways planned to upgrade railways across the country with the aid of the Asian Development Bank. The report contained a map showing the planned upgrades for the Mandalay-Myitkyina line. This map is shown in Map 34.

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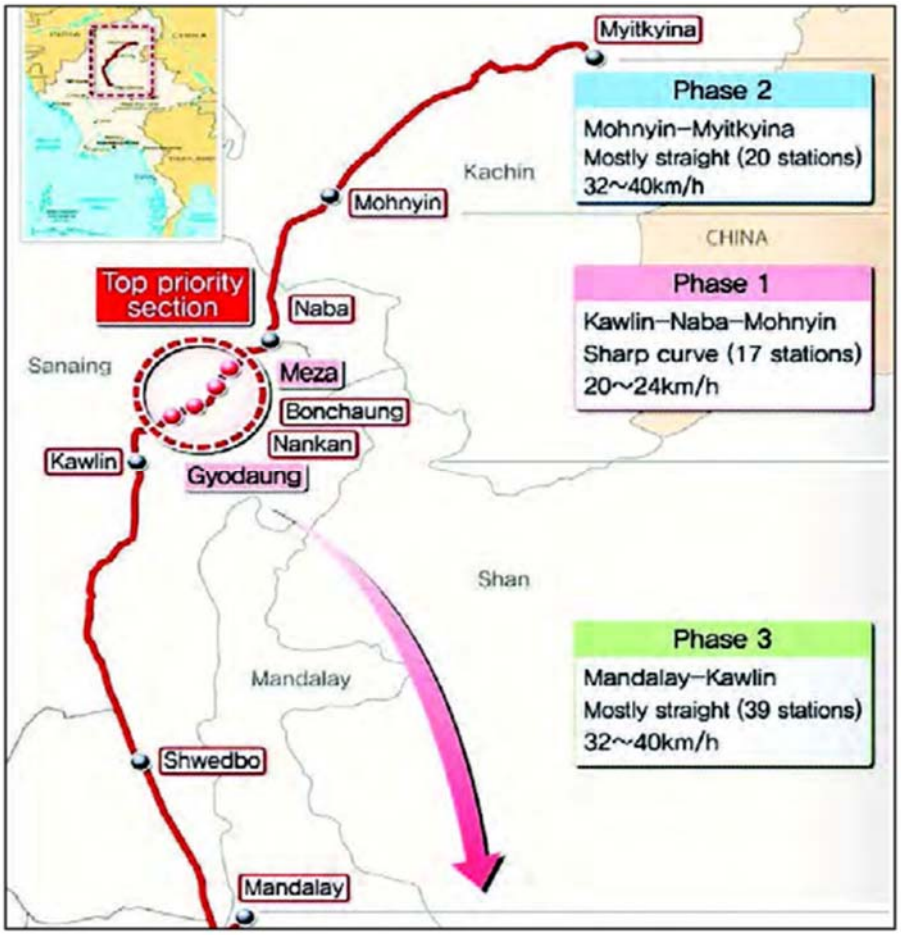
[81] *The Global New Light of Myanmar*, (2017, March 23), "Two trains collide in Kanbalu township". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-03-23-red.pdf.

The track is a single track, with passing stations such as Kanbalu, where one train will stop to allow the other to pass. One of the locomotives involved in this head-on crash was DF.1350, a locomotive manufactured in India.

[82] Roughneen, (2013, December 11), *op. cit.*

[83] Nandar Win, (2017, March 26), "One-year journey of Ministry of Transport and Communications", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-03-26-red.pdf.



Map 34: Planned upgrades for the Mandalay-Myitkyina line.

The speeds shown in this map (20 km/hr to 40 km/hr) are not very fast.[84] The review also mentioned that the Mandalay-Myitkyina line was being upgraded for the "convenience of commodity flow", possibly rice. The upgrading planned is essential given the history of derailments and accidents on the line. But it will take time. As U Thant Zin Maung, the Minister for Transport and Communications, speaking in parliament on 4th October 2016 said:[85]

> *We're doing our best to improve the transportation sector, but I cannot do everything in this government's five-year term.*

He did not mention the upgrade of the Mandalay-Myitkyina railway, but did mention work being done to improve safety measures on the road from Yangon to Mandalay and Myitkyina, which is consistent with my suggestion above that the

[84] In terms of miles per hour this corresponds to 12.4 - 24.9 miles/hr.

[85] Si Thu Lwin, (2016, October 6), "Proposal to upgrade railway kicks up friction, gets no traction", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/national-news/mandalay-upper-myanmar/22925-proposal-to-upgrade-railway-kicks-up-friction-gets-no-traction.html.

NLD government is keen to be seen improving infrastructure for the troubled Kachin State.

In conjunction with the upgrading of the line from Mandalay to Myitkyina, there have been three announcements in 2017 that should improve the service on this line.

- The first was the announcement of the funding to upgrade the locomotive workshop and the training centre at Ywa Htaung, which is on the Mandalay-Myitkyina line.[86] This was discussed in Chapter 3 in §3.4.1 above. A key objective of upgrading the workshop is to upgrade German locomotives on the Mandalay-Myitkyina line.[87]
- The second announcement concerned the introduction of express trains on the Mandalay to Myitkyina line.[88] The express trains will start operating in the current 2017-2018 fiscal year, and will consist of new coaches imported from China, similar to the new Chinese-manufactured coaches that are now in use on the Yangon-Mandalay line.[89]
- Six new 1,350-horsepower locomotives from India, a part of a contract of 18, will be employed on the Mandalay-Myitkyina line. They were delivered in May 2017.[90]

The upgrading of the Mandalay-Myitkyina line, the planned introduction of express trains utilising new coaches from China, the deployment of six new locomotives from India and the upgrading of the locomotive workshop at Ywa Htaung may all reflect a desire of the NLD government in Nay Pyi Taw to be seen to be improving the infrastructure in Kachin State, a scene of much ethnic unrest over recent years.

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[86] Pyae Thet Phyo, (2017, February 20), *op. cit.*

[87] I have also seen German locomotives on the Mandalay - Chaung U - Monywa line and the Mandalay - Chaung U - Pakokku line.

[88] Nandar Win, (2017, March 26), *op. cit.*; and

The Global New Light of Myanmar, (2017, March 30), "Myanma Railways to run express trains to Mandalay-Myitkyina". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-03-30-red.pdf; and

Khin Su Wai, (2016, December 5), "Myanma Railways to ramp up carriage production next year", *op. cit*.

[89] The new coaches will be similar to the one shown in Plate 18 in Chapter 3.

[90] *The Global New Light of Myanmar*, (2017, July 23), *op. cit*.

This contract was discussed in Chapter 3 in §3.4.1 of this thesis.

8.8 The Transport of Pulses

The agricultural sector is extremely important to Burma. One area that has been growing strongly is pulses, which are the edible seeds of plants in the legume family. The most common varieties of pulses are dried peas, edible beans, lentils and chickpeas.[91] Pulses are used as food for humans and animals. Burma produced approximately 4.3 million tons of pulses in 2015 and exported 1.24 million tons.[92] More recently, in the nine months from April to December 2016, Burma exported about one million tonnes of beans and pulses, earning over US$1 billion.[93] This was 150,000 tonnes ahead of the corresponding period in the previous year. Pulses are a key agricultural export, with a value of US$1 billion compared to US$2.075 billion of agricultural exports from Burma during this nine months period. In other words, beans and pulses were nearly 50% of agricultural exports by value.

Five varieties of pulses are exported (black gram, green gram, pigeon beans, kidney beans and cow pea), with approximately 70-80% of the exports going to India, as there are a large number of vegetarians in that country.[94] The rest are exported to China, Europe, ASEAN member states, Pakistan and Bangladesh.[95] Burma is one of the world's largest producers of pulses. Production has grown from just over 400,000 tons in 1981 to close to 4.3 million tons by 2015. This is

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[91] *Pulse Canada* website, "What is a pulse?" Retrieved from: http://www.pulsecanada.com/food-health/what-is-a-pulse.

[92] *The Government of the Republic of the Union of Myanmar*, (2015, December), *op. cit*., Tables 9.11 and 14.04.

[93] *The Global New Light of Myanmar,* (2017, January 14), "Over one million tonne of pulses exported in past nine months". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-01-14-red.pdf.

Myanmar reports exports of pulses in tonnes, but other figures (e.g. production, amount transported by rail) in tons.

[94] Roughneen, Simon, (2013, August 29), "Taking the Pulse of Burma's Bean Business", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/trade/taking-the-pulse-of-burmas-bean-business.html; and

The Global New Light of Myanmar, (2017, January 14), *op.cit*.; and

USDA Foreign Agricultural Service, (2015, April 1), "Union of Burma, Grain and Feed, 2015 Annual Report". Retrieved from: http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Grain%20and%20Feed%20Annual_Rangoon_Burma%20-%20Union%20of_4-28-2015.pdf; and

USDA Foreign Agricultural Service, (2016, April 29), "Union of Burma, Grain and Feed, 2016 Annual Report". Retrieved from: http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Grain%20and%20Feed%20Annual_Rangoon_Burma%20-%20Union%20of_4-29-2016.pdf.

[95] *The Global New Light of Myanmar*, (2017, January 14), *op.cit*.

over an eleven-fold increase over 34 years or 7.2% p.a. This growth can be seen in Figure 65.[96]

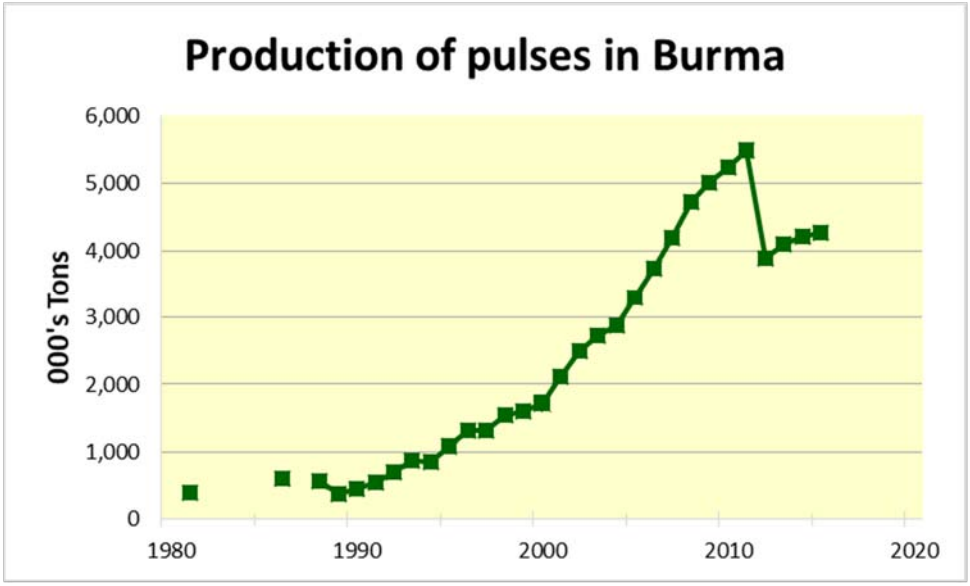

Figure 65: Production of pulses in Burma.

Exports have also grown strongly, rising from 71,000 tonnes in 1981 to 1,453,000 tonnes by 2017.[97] Exports are shown in Figure 66, with the data being converted to tons to be consistent with the other graphs.

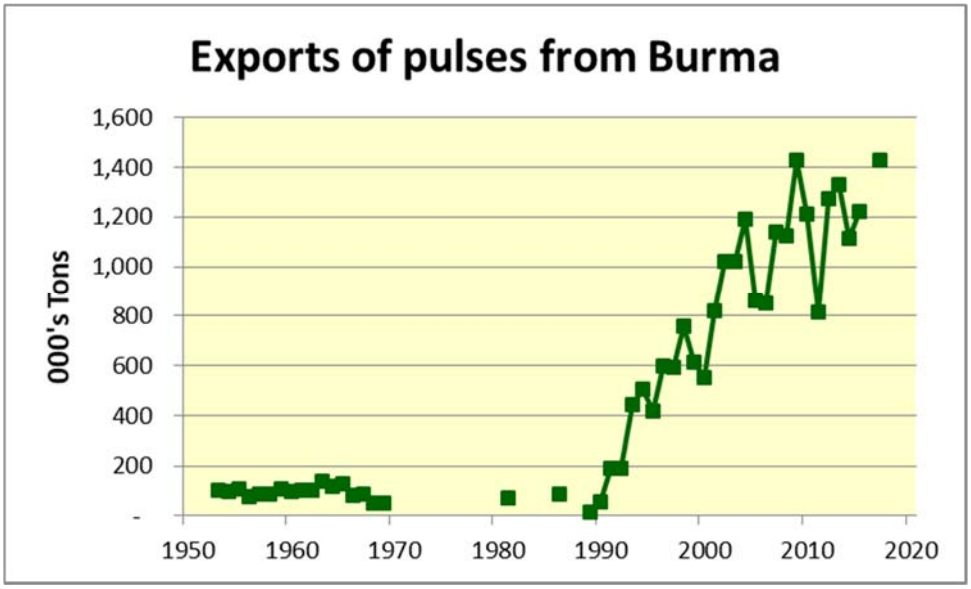

Figure 66: Exports of pulses from Burma.

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[96] The sharp drop from 2011 (5.5 million tons) to 2012 (3.9 million tons) is puzzling. Whether it is due to a change in how the Central Statistical Organization is measuring the data is unknown.

[97] A figure of 1.43 million tons (1.453 million tonnes) for pulses exported for the 2017 financial year was reported in:

The Global New Light of Myanmar, (2017, August 2), "Myanmar's pulses exports face more competition from India". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-08-02.pdf.

By contrast to the strong growth shown in the pulses sector, the railways' role in transporting pulses has been diminishing, transporting just 13,000 tons of edible grains and pulses in 2015. This is shown in Figure 67.

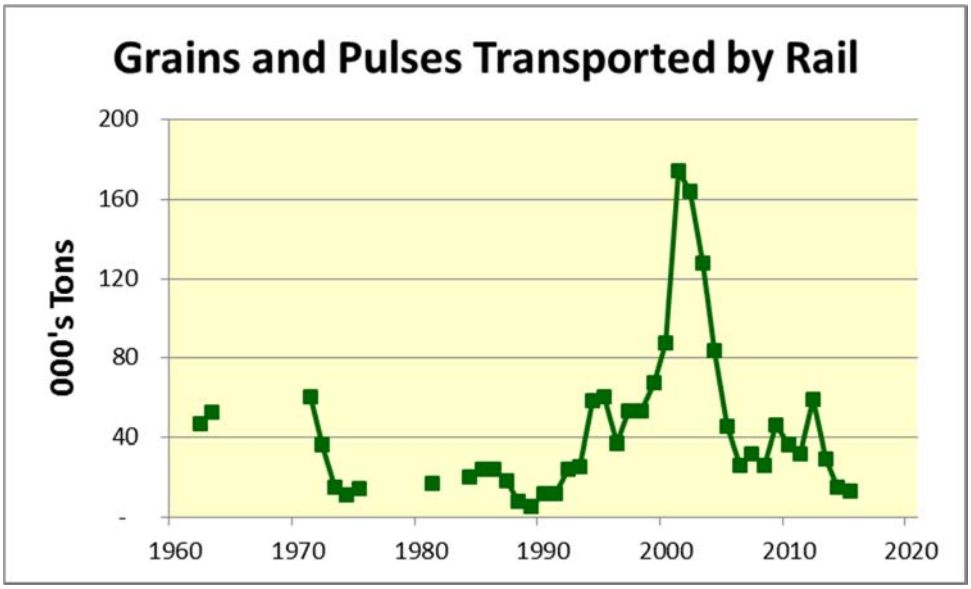

Figure 67: Grains and pulses transported by rail in Burma.

The insignificant role played by the railways is highlighted when the exports are plotted on same graph as the grains and pulses transported by rail.

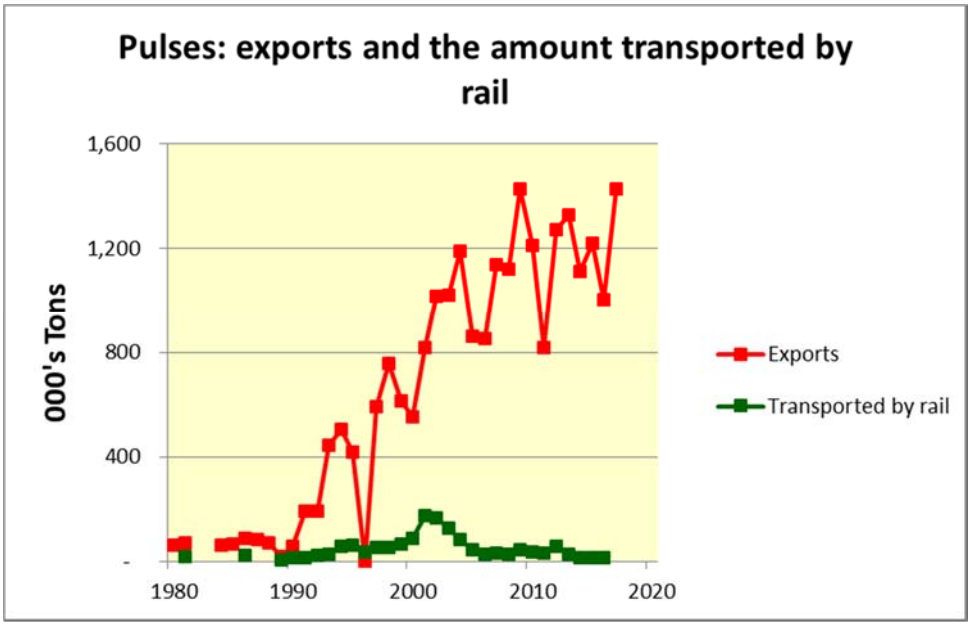

Figure 68: The level of exports and the amount of pulses transported by rail in Burma.

A new highway is being built to India, and this will see more of the exports of pulses from Burma being transported to India by road.[98] The majority of pulses are

[98] This is the India-Myanmar-Thailand Tripartite Highway which was mentioned in Chapter 5. See also:

currently transported to India by ship rather than by road transport.[99] The construction of a railway link from Mandalay to Imphal in Manipur State would be of great value in transporting pulses to India. Table 60 shows the distribution of pulse production in Burma.[100]

State or Region	Sown acreage of pulses (000's acres)	(%)
Sagaing Region	2,281	22%
Magway Region	2,075	20%
Bago Region	1,978	19%
Ayeyarwady Region	1,652	16%
Mandalay Region	1,461	14%
Yangon Region	428	4.0%
Shan State	318	3.0%
Kayin State	150	1.4%
Rakine State	106	1.0%
Mon State	53	0.5%
Kayah State	34	0.3%
Kachin State	22	0.2%
Chin State	18	0.2%
Tanintharyi Region	0.3	0.003%
Total for Burma	10,577	100%

Table 60: Sown acreage of pulses in Burma in 2015.

The top two areas are Sagaing Region (which borders Manipur and Nagaland in India) and Magway Region (in central Burma). Sagaing Region borders India and Magway Region is relatively close to India, and together they account for 41% of Burma's sown acreage of pulses. In India, pulses and beans are staple foods, but India cannot produce enough to meet local consumption, and in addition demand is quite high all year-round.[101] A railway line from India to Burma would facilitate the shipment of pulses to India, particularly from these two regions in Burma.

Press Trust of India, (2017. May 30), "Govt to begin work on India-Myanmar-Thailand highway project from June", Business Standard. Retrieved from: http://www.business-standard.com/article/current-affairs/govt-to-begin-work-on-india-myanmar-thailand-highway-project-from-june-117053001160_1.html.

[99] *The Global New Light of Myanmar*, (2017, January 14), *op.cit*.

[100] Table 60 has been compiled from data in the *Statistical Yearbook 2015*. See:

The Government of the Republic of the Union of Myanmar, (2015, December), *op. cit*., Table 9.12 on p.219-236.

[101] In October 2016 Burma and India were negotiating a deal for Burma to export 900,000 tonnes of mung and green gram to India, but India was offering a per-tonne price that was well below the domestic price within Burma. See:

8.9 The Circular Railway in Yangon

The Circular Railway in Yangon is an important mode of transport, especially as the city is becoming busier with the move towards democracy in the country. About 70,000 passengers were using the Circular Railway each day in 2016, having fallen from 100,000 two years earlier.[102] Seventy thousand passengers represents about 1.4% of Yangon's population of 5.2 million.[103] A figure of 100,000 passengers per day in 2014 is consistent with the data in Figure 6 in Chapter 3, which showed 31 million passengers on the Circular Railway for the year ended 31st March 2014.[104] There are many more cars on the road in Yangon today and the buses are becoming more crowded. The lifting of import restrictions on cars in October 2011 is a one cause of the increased traffic in Yangon. Residents of Yangon are finding it difficult to travel by car to downtown in the mornings, and particularly difficult to get out in the afternoon with roads blocked with traffic.[105]

The Circular Railway began operations in 1954, and has 38 stations on its route that is 28.7 miles long.[106] The Circular Railway is one of eight lines in Greater Yangon. These eight lines have a total length of 91.3 miles (146.9 *km*) and there are 58 stations. These lines are listed in Table 61 below:[107]

Chan Mya Htwe, (2016, October 21), "Myanmar weighs merit of India bean agreement", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/business/23243-myanmar-weighs-merits-of-india-bean-agreement.html.

[102] San Yamin Aung, (2014, April 30), "To Avoid Gridlock, Commuters Take to Rangoon's Circle Train", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/burma/multimedia-burma/avoid-gridlock-commuters-take-rangoons-circle-train.html; and

Aye Min Soe, (2015, March 25), "Yangon circular railroad to receive 100 new air-conditioned cars within year", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-03-25-red.pdf.

The figure of 70,000 is coming from Myanma Railways and reflects the fact that passenger numbers are falling. See:

The Global New Light of Myanmar, (2015, July 6), *op. cit*.; and

The Global New Light of Myanmar, (2015, August 17), "Circular trains linked with air-con coaches". Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-08-17-red.pdf.

[103] *Department of Population, Ministry of Immigration and Population*, (2015, May), *op. cit*., p.60.

[104] *Ministry of Rail Transportation*, (2014, October 13-15), *op. cit*.

[105] Deed, Stuart, (2015, January 26), "Seeking a shortcut on the train", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/special-features/203-wheels-2015/12936-seeking-a-shortcut-on-the-train.html.

[106] Etherton, David and Terry Standley, (1991),"Human Settlements Sector Review: Union of Myanmar", The United Nations Centre for Human Settlements (Habitat), Nairobi, p.72.

[107] *Japan International Cooperation Agency*, (2015, January), "Pre-Feasibility Study on the Yangon Circular Railway Modernization Project", p.1. Retrieved from: http://open_jicareport.jica.go.jp/pdf/12185146_01.pdf.

Route	Length (km)	Number of Stations	Single/Double Track
Main Line			
Yangon Circular Railway	46.1	38	Double track
Yangon-Mandalay Line	26.3	6	Double track
Yangon-Pyay Line	20.1	4	Double track
Branch Lines			
Thilawa Branch Line	26.2	5	Single track
Eastern University Branch Line	5.4	1	Single track
Dagon University Branch Line	8.0	1	Single track
Computer University Branch Line	2.9	1	Single track
Yangon Port Freight Branch Line	9.9	2	Single track
	144.9	**58**	

Table 61: The current railway network in Greater Yangon.

The route of the Circular Railway is shown in Map 35.[108] Some of the other lines listed in Table 61 can also be seen in this map.

Map 35: The Circular Railway in Yangon.

[108] This map is sourced from:

Wikipedia website, "Yangon Circular Railway". Retrieved from: https://en.wikipedia.org/wiki/Yangon_Circular_Railway.

The number of the trains on the line each day increased from 200 in 2013 to 221 by February 2017.[109] More important than the number of services each day is the fact that modern Japanese RBE's are in use on the line, thereby improving the quality of service.[110] Prior to the purchase of these Japanese RBE's, the only trains operating on the Circular Railway were old and were hauled by diesel locomotives, and the interior of the carriages were not very comfortable. The older style Circle Train is shown in Plates 154 and 155 below.

Plate 154: The Circle Train at Yangon Central Railway Station.

[109] *Ministry of Transport and Communications*, (2017, March 15), *op. cit*.

[110] Soe Win, (2016, July 14), "RBE trains to run between Taikkyi, Insein this month", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs22/GNLM2016-07-14-red.pdf.

Plate 155: Inside a carriage on the Circle Train, in January 2009.

Many of the platforms on the Circular Railway are in poor condition, and need improving. An example, Kamayut Station, is shown in Plate 156 below.

Plate 156: A platform in a state of disrepair, at Kamayut Station on the Circular Railway.

Work has begun at some of the stations to improve the platforms.[111] An example of the type of work being done can be seen in Plate 157 below.[112] In this case, the platform was being re-built at Kemmendine Station.

Plate 157: A platform being re-built at Kemmendine Station on the Circle Line in Yangon.

Myanma Railways has introduced two upper-class trains and one air-conditioned train running on the Circular Railway.[113] The fares on these two trains are more expensive, but they offer more comfort than can be found on the older-style Circle Train. In March 2015, Myanma Railways announced that it was buying 100 new air-conditioned carriages from Japan for use on the Circular Railway.[114] A train with five RBE coaches was put into service in early July 2015, and another two air-conditioned RBE coaches and an RBT (Rail Bus Truck) were

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[111] Ko Moe, (2017, August 27), "Yangon city railway upgrade in October", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-08-27.pdf.

My most recent trip on the Circle Line was in January 2017, when I travelled around it twice. Work in improving the platforms at some of the stations was quite evident.

[112] The photograph in Plate 157 was taken on 19th January 2017.

[113] Kyaw Hsu Mon, (2013, September 27), "Air-Conditioned Train to Ride Rangoon's Circle Line Soon", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/z_rangoon/air-conditioned-train-ride-rangoons-circle-line-soon.html; and

San Yamin Aung, (2014, April 30), *op. cit.*

[114] Aye Min Soe, (2015, March 25), *op. cit*.

Thirty-two of these new air-conditioned carriages arrived in late May 2015. See:

Saw Lin Let, (2015, May 29), "Air-conditioned train carriages arrive from Japan", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-05-29.pdf.

put into service in August 2015.[115] A further ten coaches arrived from Japan in September 2015.[116] Two Circle-Line trains made up of Japanese RBE's are shown in Plates 158 and 159 below.[117]

Plate 158: A Circle Train made up of Japanese RBE's at Yangon Central Railway Station.

[115] *The Global New Light of Myanmar*, (2015, July 6), *op. cit*.; and *The Global New Light of Myanmar*, (2015, August 17), *op. cit*.

[116] Khaing Thanda Lwin, (2015, September 1), *op. cit.*

[117] These photographs were taken in late January 2016.

Plate 159: A Circle Train made up of Japanese RBE's at Insein Station.

These Japanese RBE's are far more comfortable to travel in than the older passenger coaches, which were hauled by a diesel locomotive, shown in Plates 154 and 155 above. Plate 160 below shows the interior of the train in Plate 159. This train was not air-conditioned.

Plate 160: The interior of a non-air-conditioned RBE Circle Train coach.

Plate 161 shows the interior of an air-conditioned RBE on the Circular Railway.[118]

Plate 161: The interior of an air-conditioned RBE coach on the Circular Railway.

With improving conditions on the trains on the Circular Railway, more foreign tourists are using the line to see a snapshot of Yangon.[119] The new air-conditioned coaches will not only be used on the Circular Railway, but may also be used on the main line from Yangon to Nay Pyi Taw.[120] In addition to the coaches being purchased, Japan gave Myanma Railways fifteen air-conditioned coaches as a gift in 2015.[121] These were second-hand and were worth about Kyat 100 million each (about US$80,000 each).

There is a clear policy of upgrading the rolling stock on the Circular Railway from trains consisting of relatively old carriages hauled by old locomotives (such

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[118] This coach is of the type in the train shown in Plate 158. Twenty three of these cream-coloured RBE coaches arrived from Japan in September 2015, but Myanma Railways decided not to use all of them as air-conditioned as this would be too expensive for the many low-income passengers who use the route. See:

Soe Win, (2015, September 8),"Air-con coaches arrive at MITT in Yangon", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-09-08-red.pdf.

[119] *The Global New Light of Myanmar,* (2017, August 31), "Circular train popular with tourists". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-08-31.pdf.

In Plate 161 the three women on the right were tourists from South Korea, and were doing just this – seeing a snapshot of Yangon.

[120] *Ibid*.

The possible usage of the RBE's on the main line is a surprising move, as up until now the trains have been conventional passenger coaches hauled by a locomotive.

[121] Aye Min Soe, (2015, March 25), *op. cit*.

as shown in Plate 154) to more modern RBE's, some of which are air-conditioned. In summary, Myanma Railways is putting a lot of effort into rail transport in Yangon:

- An air-conditioned train with five RBE's was put into service in early July 2015, launched by the then Minister for Rail Transportation, U Than Htay.
- Two new RBE air-conditioned coaches were put into service in August 2015, with the new minister, U Nyan Tun Aung, in attendance. He was also at the launch in July 2015 as he was Minister for Transport.
- There are 23 trains operating each day on the Circular Railway, nine of which are Diesel Multiple Units (i.e. RBE's). The aim is to replace all the older-style ones with Diesel Multiple Units by 2018.[122] In October 2016, Myanma Railways announced that the old circular railway trains (i.e. the ones currently hauled by diesel locomotives) will be replaced by 66 DMU's from Japan.[123]
- In August 2017 a tender invitation was put out for the supply of eleven train sets of six cars each of DEMU's, to be used on the Circular Railway.[124] These are in addition to the four train sets of DEMU's of six cars each (a total of 24 coaches) for use on the Yangon to Mandalay line. These were the subject of a tender in December 2016 as discussed in §8.6 above.
- An electric tramway was built along Strand Road, but this service has now been suspended due to low passenger numbers.[125]

Much more needs to be done, but the construction of an underground railway or a Skytrain system similar to what Bangkok has is many years off. In fact, in 2014 the Japan International Cooperation Agency (JICA) submitted a master transport plan for Yangon, which suggested that an elevated railway and an underground mass transit railway were needed for Yangon, as the population of the city is forecast to double by 2040.[126] JICA proposed two lines for Yangon: one from the

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[122] *The Global New Light of Myanmar*, (2016, June 29), "Yangon circular train coaches to be replaced with DMU coaches in 2018". Retrieved from: http://www.burmalibrary.org/docs22/GNLM2016-06-29-red.pdf.

[123] *The Global New Light of Myanmar*, (2016, October 14), "66 coaches for RBE train to arrive in 2018". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2016-10-14-red.pdf.

[124] *The Global New Light of Myanmar*, (2017, August 2), "Invitation for Bid", p.13. Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-08-02.pdf.

[125] See §8.10 of this chapter.

[126] Allen, Jordan, (2016, December 31), "Yangon rail system to get upgrade", The Japan Times. Retrieved from: http://www.japantimes.co.jp/news/2016/12/31/business/yangon-rail-system-get-upgrade/#.WXM-cIiGMdU; and

south to the north of the city, going up to the airport; and another from the east to the west of the city.

The upgrade of the Circular Railway is being funded by a loan of US$207 million from Japan.[127] The loan is a part of Overseas Development Aid received from Japan. Plans for the upgrade of the Circular Railway were detailed in a pre-feasibility study prepared by the Japan International Cooperation Agency in 2015.[128] The upgrade of the Circular Railway involves the addition of new rolling stock, improved ballasting, improved stations and improved signalling equipment and is due to be completed by 2021[129].

What is clear is the increasing involvement of Japan in supplying rolling stock and assisting in the upgrade of the railway network, in the first instance the Circular Railway in Yangon and the main line from Yangon to Mandalay. The Japanese are getting a much bigger foothold than the Chinese in my opinion. The Chinese are involved in the factories in Nay Pyi Daw and Mandalay building locomotives and coaches, and will be the key player in the China-Burma Railway if it ever goes ahead. Japan and China compete internationally on the railway front, with China recently winning out over Japan by securing a major multi-billion contract with Indonesia to build a 150 *km* a high-speed rail line from Jakarta to Bandang.[130] Analysts are suggesting that China's success in securing this contract makes it the front-runner for other rail projects in the region, including a high-speed rail link between Singapore and Kuala Lumpur.[131] It will be at least 2026 before this line

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Japan International Cooperation Agency, (2014, August 28), "Transport Master Plans Unveiled for the Myanmar and the Yangon Metropolitan Area". Retrieved from: https://www.jica.go.jp/english/news/field/2014/140828_01.html; and

Japan International Cooperation Agency, (2014, May 14), "Yangon Urban Transport Master Plan of the Project for Comprehensive Urban Transport Plan of the Greater Yangon (YUTRA). Major Findings on Yangon Urban Transport and Short-Term Actions". Retrieved from: https://www.jica.go.jp/english/news/field/2014/c8h0vm00008wqgw0-att/YUTRA.pdf; and

Japan International Cooperation Agency, (2014, August 27), "New Transport System, of Yangon City". A video recording on YouTube. Retrieved from: https://www.youtube.com/watch?v=EAlVxV3TgSI&list=UU5P5cIqwAoPNUkWSiXrKmXw.

[127] Khaing Thanda Lwin, (2015, September 1), *op. cit.*

[128] *Japan International Cooperation Agency*, (2015, January), *op. cit*.

[129] Khaing Thanda Lwin, (2015, September 1), *op. cit.*

[130] Kapoor, Kanupriya and Cindy Silviana, (2015, September 30), "Indonesia rewards China's "courage" with high-profile rail contract", Reuters. Retrieved from: http://www.reuters.com/article/2015/09/30/indonesia-railway-idUSL3N11Z3QH20150930.

[131] *Ibid*.

is operating.[132] This may have long-term implications for Burma. But currently Japan is winning out in Burma. For example, in September 2015 when Japan donated six RBE's to Myanma Railways much was made of this donation, with a ceremony at Yangon Central Railway Station attended by the Minister for Rail Transportation (U Nyan Tun Aung), the Ambassador for Japan, and various executives from the East Japan Railway Company.[133] As an indication of the inroads Japan is making, Myanma Railways now has 237 coaches either donated by Japan or purchased from Japan.[134] Many of these are the RBE's running on the branch lines.

Much effort and funds are being put into upgrading the Circular Railway: new rolling stock is operating on the line; some stations are being upgraded; and work is being done on improving the signalling for the line. Electronic equipment, which is used in signalling and is being installed near Yangon Central Railway Station, can be seen in Plate 162 below.[135]

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[132] *Railway Gazette*, (2016, July 19), "Kuala Lumpur – Singapore high speed line to open in 2026". Retrieved from: http://www.railwaygazette.com/news/high-speed/single-view/view/kuala-lumpur-singapore-high-speed-line-to-open-in-2026.html.

[133] Soe Win, (2015, September 30), "Japanese railway coaches make test run", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-09-30-red.pdf.

The six RBE coaches were part of a group of 19 coaches donated to Myanma Railways through the Japanese government's Grant Assistance for Grassroots Human Security Projects Scheme. These six coaches were to be used for making test runs on the Yangon to Bago line.

[134] *Ibid*.

[135] This photograph was taken on 17th January 2017, and shows a Circle Train leaving Yangon Central Railway Station. It is one of the Japanese RBE's. The red arrows indicate the electronic signalling equipment. One year later, in January 2018, when I travelled along the Circular Railway from Insein to Yangon Central Railway Station, installation of signalling equipment was still taking place.

Plate 162: Signalling equipment being installed near Yangon Central Railway Station.

Given the size of Yangon and the traffic difficulties it is experiencing, upgrading of the Circular Railway will be welcomed, but in the longer term, a much more modern suburban railway needs to be constructed.

8.10 Electric Trams in Yangon

Tram and light rail services are making a comeback in many cities around the world. There is a history of electric tramways operating in both Rangoon and Mandalay in the first half of the twentieth century, with a small tramway system being operated in Rangoon by the Rangoon Electric Tramway and Supply Company from 1906 to 1945.[136] By 1921, there were 22 kilometres of track in Rangoon with 77 tramcars in operation.[137] After 1937 the company added an efficient trackless tram system.[138] An electric tramway was operated in Mandalay from 1904 to 1945: by 1921 there were 11 kilometres of track with 24 tramcars in

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[136] Sechler, Robert P., (2000), "Electric traction in the Burmese capital: A History of the Rangoon Electric Tramway and Supply Company, Limited", Second edition. Published by the author, Cypress, USA; and

Andrus, (1947), *op. cit*., p.151; and

Rossman, John, (1998), *Tram Views of Asia* website. Retrieved from: http://www.tramz.com/tva/mm.html; and

Ford, Jan, (2015, July 5), "Rangoon Tramways", *Jan Ford's World* website. Retrieved from: https://janfordsworld.blogspot.com.au/2015/07/rangoon-tramways.html.

[137] Rossman, (1998), *op. cit.*

[138] Andrus, (1947), *op. cit*., p.151.

operation.[139] Mandalay is particularly well-suited to an electric tramway or light rail system because of its very wide streets laid out on a grid pattern. Electric tramways are a possible solution for some of the traffic congestion problems in Yangon. For Mandalay, they could certainly provide an improvement in public transport in the city.

A modern electric tram service along Strand Road was launched in January 2016, but was suspended five months later.[140] A precursor to this was a service operated by Rail Bus Engines (RBE's) along Strand Road. This service was launched in early December 2014, following the same tram route used by the British before Independence.[141] An RBE on Strand Road is shown in Plate 163 below.[142]

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[139] *Ibid*.

[140] Soe Win, (2016, January 11), "The Tram is Back. Electric commuter tramcar line launched on Strand Road", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2016-01-11-red.pdf; and

Soe Win, (2016, July 1), "Stand tram suspended", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs22/GNLM2016-07-01-red.pdf.

[141] May Soe San, (2014, December 1), "Commuter Train Service to Begin on Strand Road", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/burma/commuter-train-service-begin-strand-road.html; and

Saw Thein Win, (2014, December 8), "RBE trains launched along Strand Road", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs20/GNLM2014-12-08-red.pdf; and

Radio Free Asia, (2014, December 17), "New Tram Service Eases Yangon's Traffic Problems". Retrieved from: http://www.radiofree.org/us/new-tram-service-eases-yangons-traffic-problems/.

The RBE shown in the Radio Free Asia video is RBE.30.02, which is more modern than the RBE's I have observed on the rural lines.

[142] This photograph was taken by Saw Thein Win and appeared in *The Global New Light of Myanmar*. See:

Saw Thein Win, (2014, December 8), *op. cit*.

Plate 163: An RBE travelling along Strand Road in December 2014.

This line has in the past been used as a goods line taking cargo to and from the Yangon port. Myanma Railways was operating the RBE service, and its purpose was to help ease traffic congestion in Yangon. New stations were built along the line connecting Ahlone Township in the west of Yangon to Pazundaung Township in the east of Yangon.[143] The diesel railcars (RBE's) are heavy rail compared to the light rail of the electrified tramway system launched in early 2016.

The line along Strand Road was converted to an electric tram service in 2015, and was planned to eventually be seven miles in length.[144] A four-mile section was opened in January 2016, running from Wardan Jetty to Linsadaung (also known as Lans Down), but the service was suspended in June 2016 due to the small number of passengers.[145] The tramcars were second-hand ones from

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[143] New stations were planned at Wardan Street, Sinn O Dan Street, Sule Pagoda Road and Thakin Mya Garden. One station had already been built at Botahtaung Township. See:

May Soe San, (2014, December 1), *op. cit.*

[144] *The Global New Light of Myanmar*, (2015, July 28), "Yangon electric tramline to open in October". Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-07-28-red.pdf; and

Soe Win, (2015, August 22), "Tram, train carriages arrive at Thilawa terminal", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-08-22-red.pdf; and

Soe Win, (2016, January 6), "Yangon to see electric commuter tramcar line on Strand Road", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2016-01-06-red.pdf; and

Kyaw Hsu Mon, (2016, January 6), "After a Long Wait, Commuter Tram May Finally Reach Rangoon", The Irrawaddy. Retrieved from: http://www.irrawaddy.com/burma/after-a-long-wait-commuter-tram-may-finally-reach-rangoon.html.

[145] Soe Win, (2016, July 1) *op. cit.*.

Japan, and were supplied by West Corporation of Japan who was operating the line as part of a US$3.6 million deal signed in July 2015.[146] The tramcars were fifty years old, according to the Ambassador from Japan, Mr Tateshi Higuchi, but had been well maintained.[147] The Strand Road tram is shown in Plate 164 below.[148]

Plate 164: The new tram waiting to depart from the stop on Strand Road at Wardan Jetty.

There was only one tram, and the three cars had a seating capacity of 150, but could accommodate up to 250 passengers.[149] The tram was running six times a

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[146] The link between Myanma Railways and West Corporation goes back at least to early 2011, when the company donated four fire engines to Myanma Railways. See:

The New Light of Myanmar, (2011, April 8), "Locomotive Sheds get fire engines". Retrieved from: http://www.burmalibrary.org/docs11/NLM2011-04-08.pdf.

There has also been controversy concerning West Corporation relating to a US$2 million tender for new coaches put out by Myanma Railways in February 2016. As at March 2016 West Corporation was the only company to lodge a bid, and indeed had imported coaches to Burma a few months before the tender was announced. One commentator suggested that other companies saw no point in tendering because a deal had already been made. See

Sithu Aung Myint, (2016, March 13), "Curiouser and curiouser. There's something odd about the Ministry of Rail Transportation's tendering system and the way it spends taxpayers' money", Frontier Myanmar. Retrieved from: http://frontiermyanmar.net/en/curiouser-and-curiouser.

[147] Aye Nyein Win, (2016, January 11), "Trams return to Yangon after 100 years", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/business/18422-trams-return-to-yangon-after-100-years.html.

[148] I took this photograph on 30th January 2016, just three weeks after the service commenced. There were only a few passengers on board.

[149] Soe Win, (2016, January 6), *op. cit.*; and

Soe Win, (2016, July 1), *op. cit.*

day between 8:00am and 1:00pm, with three trips in each direction along Strand Road. The interior of the tram is shown in Plate 165 below.

Plate 165: The interior of the tram operating along Strand Road.

There were five stops on the tram line along Strand Road, servicing Wardan Jetty, Sintohedan, Pansodan, Botahtaung and Linsadaung.[150] As Plates 164 and 165 show, the tram was modern in appearance in spite of its age, with a clean and functional interior. The service was suspended due to a lack of passengers, and because of the potential risk of causing accidents.[151] U Tun Aung Thin, a General Manager from Myanma Railways, announced that they plan to keep the tram in the locomotive shed depot in Wardan Jetty and run it during heavy traffic (i.e. peak periods). He also flagged the possibility of running it longer distances to attract more passengers.

The introduction of a passenger service on Strand Road serviced initially by RBE's and subsequently by an electrified tramway was a part of Myanma Railways' effort to address the traffic congestion in Yangon. The flaw in Myanma Railways plans was to set up an electric tram service on a route where passenger

[150] Kyaw Hsu Mon, (2016, January 6), *op. cit.*

[151] Soe Win, (2016, July 1), *op. cit.*

demand is low. U Tun Aung Thin indicated in January 2016 that the reason for using this route was as follows:[152]

We decided to start with the Strand Road route because there's already a cargo rail there.

This was a poor reason for choosing this route, but it was easy and quick to set up and get into operation, as it was a route dating back to the early 1900's. An aerial view of the route (near the Strand Hotel) is shown in Plate 166 below.[153]

Plate 166: An aerial view of the tram route on Strand Road, near the Strand Hotel.

I travelled up and down this route on 30th January 2016. There was no timetable on display at the tram stops (it is posted inside the tram); there were no staff at the stops to provide information; and the route along Strand Road was in many ways servicing a port area, not a busy retail or residential area. The facilities at the five tram stops were poor, with no shelter from the weather. The only indication that it was a tram stop were three orange-painted concrete steps to help passengers board the tram, as shown in Plates 167 and 168 below.

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[152] U Tun Aung Thin, quoted in:

Kyaw Hsu Mon, (2016, January 6), *op. cit.*

[153] This photograph was taken at 2:30pm on 27th January 2016.

Plate 167: The tram stop at Lans Down (Linsadaung).

Plate 168: The tram stop opposite the Strand Hotel.

At both these stops, it was difficult for pedestrians to cross Strand Road from the other side of the road if they wished to catch the tram, unless they used the overhead walkway that has been built near the Strand Hotel. The overhead

walkway can be seen in Plate 168 above. The photograph in Plate 169 illustrates how heavy the traffic can be on Strand Road.[154]

Plate 169: The tram line on Strand Road.

The tram line can be seen in the bottom left-hand corner of the photograph. There are three trucks loaded with containers coming along this part of Strand Road. Most of the vehicular traffic is on Strand Road on the other side of the dividing barrier. Except for where the overhead walkway is, it was neither an easy nor a safe task for prospective tram passengers to get to the side of the road where the tram line is located.

Much more care and thought needs to be put into identifying where a light rail or tram service should be built. One such location might be along Sule Pagoda Road, for example. Light rail and tram services are making a comeback around the world, and there should be a role for such a service in a traffic-congested city such as Yangon. An electrified tramway service or a light rail system would be of value in Yangon, but needs to be properly planned.

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[154] This photograph was taken by Nyi Zaw Moe on 20th July 2016 and appeared in *The Global New Light of Myanmar*. See:

The Global New Light of Myanmar, (2016, July 30), "Revenue authorities collect pre-income tax of K4b from vehicle imports". Retrieved from: http://www.burmalibrary.org/docs22/GNLM2016-07-30-red.pdf.

8.11 An Optical Fibre Cable Network along the Railway Lines

A recent development with Myanma Railways is the push to build an optical fibre cable network along the railways.[155] Myanma Railways is installing a 630 *km* long optical fibre cable along the Yangon-Mandalay line.[156] In February 2017 Myanma Railways called for expressions of interest from companies for the installation of an optical fibre network along three other major lines, which are shown in Table 62.[157]

Rail Line	Length (km)
Yangon - Moulmein - Dawei	598
Manadalay - Myitkyina	539
Yangon - Pyay	258
	1,395

Table 62: The next three railway lines along which an optical fibre cable will be installed.

The aim is to install an optical fibre cable network along its network in order to improve communication on the rail network, but also to allow outside users to use it to provide internet service throughout Burma. Myanma Railways laid out its plans for an optical fibre cable network in a presentation by U Ba Myint, Senior General Manager (Inspection), in July 2015. The beauty of the plan is that Myanma Railways can use its own right of way to lay the cable – it does not have to acquire any land. This technique is common around the world: a digging tool and the cable layer is transported on a specialised rail vehicle and moves along the track digging a trench parallel to the track and laying the cable.[158] U Ba Nyint stressed that the optical fibre cable project will help reduce the subsidies Myanma Railways needs to receive from government. Apart from the value to Myanma Railways, there is a great benefit to Burma in installing this network and providing internet access to

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[155] Zayar Nyein, (2015, March 3), "Myanma Railways Invites Consultancy Proposal to Build Fibre Cables", Myanmar Business Today. Retrieved from: http://www.mmbiztoday.com/articles/myanma-railways-invites-consultancy-proposal-build-fibre-cables.

[156] *Consult-Myanmar*, (2014, April 30), "Ministry of Rail Transportation: Invitation to Tender for Optical Fiber Cable, Closing Date: 27th May, 2014". Retrieved from: https://consult-myanmar.com/2014/04/30/ministry-of-rail-transportation-invitation-to-tender-for-optical-fiber-cable-closing-date-27th-may-2014/.

[157] *Ministry of Transport and Communications*, (2017, February 6), "Invitation for Expression of Interest ("EOI") for optical fiber cable installation (Phase-3) on Yangon-Mawlamyaing-Dawei railway track, Yangon-Pyay railway track and Mandalay-Myitkyina railway track from local companies". Retrieved from: http://www.vdb-loi.com/wp-content/uploads/2017/02/Myanma-Railways-Invitation-EOI.pdf.

[158] Tanner, Jane, (2000, May 6), "New Life for Old Railroads; What Better Place to Lay Miles of Fiber Optic Cable", The New York Times. Retrieved from: http://www.nytimes.com/2000/05/06/business/new-life-for-old-railroads-what-better-place-to-lay-miles-of-fiber-optic-cable.html?pagewanted=all.

remote towns. An example of a third-world country where it has been proposed that the railways be used to install such a system is Sudan.[159]

The installation of an optical fibre cable network by Myanma Railways will not only help it improve the efficiency of its operations, but may also generate extra revenue. Myanma Railways hopes that the underground optical fibre cables can be leased to businesses that require high-speed data transmission, while at the same time Myanma Railways can use it for its own communications.[160] There are other optical fibre cables in use in Burma, but these are often installed along electricity grids or gas pipelines, and frequently bypass towns. A key feature of the Myanma Railways optical fibre cable network is that it will pass through towns, and will cover a large portion of the country.

The laying of optical fibre cables along railway lines can be compared to the development of the telegraph in the mid 1800's in the UK. The development of the telegraph was initially tied to the needs of the railway in the UK.[161] The electric telegraph was first demonstrated by Cooke and Wheatstone in July 1837. The demonstration took place between Euston and Camden Town, which were one mile apart. The telegraph was used to signal the starting and stopping of a cable system at Euston Station, enabling trains to be pulled up the steep incline to Camden Town. The first commercial electric telegraph line was installed in August of the same year, and marked the start of a close relationship between the railways and the telegraph system. This system was discontinued in January 1838 due to its complexity, but the Great Western Railway stepped into the void and by July 1839 a permanent electric telegraph system was in operation between London Paddington and West Drayton. The telegraph was used for train management, allowing trains to travel on single tracks safely. Cooke and Wheatstone applied for patents in the US and Europe, and similar systems were soon built in France, Germany and Belgium. In 1843 the first public access was granted to the

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[159] Saleh, Ammar A., Amin B.A. Mustafa and Ashraf A. Oman, (2015), "Proposal Laying Fiber Optic for Cables along Railways Tracks in Sudan", Journal of Computer Engineering, Volume 17, Issue 1, Jan-Feb 2015, pp.90-94.

[160] Zayar Nyein, (2015, March 3), *op. cit.*

[161] Smith, Christopher (2017, July 25), "How the UK's railways shaped the development of the telegraph", BT. Retrieved from: http://home.bt.com/tech-gadgets/history-of-communication-uk-railways-telegraph-patent-cooke-wheatstone-11364186628315; and

Roberts, Steven, "A History of the Telegraph Companies in Britain between 1838 and 1868", *Distant Writing* website. Retrieved from: http://distantwriting.co.uk/cookewheatstone.html.

telegraph, and by 1846 the UK parliament had mandated that the telegraph lines should be open to everyone, not just the railways. A century and a half later, a similar situation is occurring in Burma. The optical fibre cable is being laid alongside the railway tracks and will be used by Myanma Railways to control the rail traffic.[162] The general public will have access for internet usage. But ominously, the military will also be able to use the optical fibre network for its own purposes.

8.12 The Minister Responsible for Myanma Railways

The new NLD government has a smaller ministry compared to the previous government. Eighteen ministries have been set up, in addition to three ministries reserved for the military under the 2008 Constitution. Under the former quasi-military government headed by President Thein Sein, the railways had its own ministry, the Ministry of Rail Transportation. Myanma Railways is now a part of the Ministry of Transportation and Telecommunications.

The minister responsible for Myanma Railways has changed frequently in recent years. The recent ministers heading the Ministry of Rail Transportation were:

- U Aung Min: 1st February 2003 to 27th August 2012.[163]
- U Zeya Aung: September 2012 to July 2013.[164]
- U Than Htay: 25th July 2013 to 12th August 2015. U Than Htay was replaced in the putsch on 12th August 2015 which saw Speaker Shwe Mann removed from power, as well as a number of ministers.[165]

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[162] In the rural regions in Burma there are many single-line tracks with some stations having double track to enable trains to pass. The use of optical cable fibre will hopefully make the control of rail traffic more efficient.

[163] *Wikipedia* website, "Aung Min". Retrieved from: https://en.wikipedia.org/wiki/Aung_Min.

[164] *Wikipedia* website, "Zeya Aung". Retrieved from: https://en.wikipedia.org/wiki/Zeya_Aung; and

Nan Tin Htwe, (2013, July 27), "Myanmar's cabinet undergoes strategic reshuffle", Myanmar Times. Retrieved from: https://www.mmtimes.com/national-news/7585-myanmar-s-cabinet-undergoes-strategic-reshuffle.html.

[165] *The Global New Light of Myanmar*, (2015, August 13), "Myanmar president reshuffles cabinet". Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-08-13-red.pdf; and

Fuller, Thomas, (2015, August 13), "Ruling Party of Myanmar Ousts Its Leader Amid a Government Reshuffle", The New York Times. Retrieved from: http://www.nytimes.com/2015/08/14/world/asia/in-myanmar-Thura-Shwe-Mann-is-removed-as-chairman-of-ruling-party.html?_r=0; and

Yen Saning, (2015, August 13), "Ministerial Resignations Linked to Shwe Mann Purge", The Irrawaddy. Retrieved from: http://www.irrawaddy.org/burma/ministerial-resignations-linked-to-shwe-mann-purge.html.

- U Nyan Tun Aung: 4th August 2015 until March 2016.[166]

U Nyan Tun Aung, the last minister from the former government headed by President Thein Sein, was also the Minister of Transport and was a former colonel in the Myanmar Air Force.[167] U Nyan Tun Ang was the fourth person to hold the position of Minister for Rail Transportation in three years. Such instability at the top of the Ministry for Rail Transportation was not good for continuity of policy and priorities. U Nyan Tun Ang's background as a colonel in the Myanmar Air Force was hardly a suitable background to be in charge of an important ministry such as Rail Transportation.

The new NLD government has established a Ministry of Transportation and Telecommunications, and the minister is U Thant Zin Maung, who was formerly employed as a General Manager with Myanma Railways.[168] U Thant Zin Maung won a seat in the Pyithu Hluttaw (the lower house of parliament) for the National League for Democracy in his hometown of Monywa. Being from Monywa, he should be well aware of the shortcomings of Myanma Railways in the rural areas.[169] Monywa itself is important with a line possibly one day being built to Kalaymyo and then on to Tamu to be a part of the proposed railway linking India and Burma. The line from Kalaymyo to Pakokku needs to be re-opened by rebuilding the collapsed Ponnya Taung Railway Tunnel. U Thant Zin Maung should have a good understanding of the local transport issues in this part of Burma.

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[166] *The Global New Light of Myanmar*, (2015, August 15), "President announces three ministerial appointments". Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-08-15-red.pdf.

[167] Kudo, Toshihiro, (2011, July 26), "New Government in Myanmar: Profiles of Ministers", Institute of Developing Economies, Japan External Trade Organization. Retrieved from: http://www.ide.go.jp/English/Research/Region/Asia/20110726.html.

[168] *The Irrawaddy*, (2016, March 24), "Meet Burma's Next Cabinet". Retrieved from: http://www.irrawaddy.com/burma/meet-burmas-next-cabinet.html.

Lun Min Mang, Aung Shin, Thomas Kean and Laignee Barron, (2016, March 23), "Who's who: Myanmar's new cabinet", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/national-news/nay-pyi-taw/19609-who-s-who-myanmar-s-new-cabinet.html.

U Thant Zin Maung was born in November 1953, holds a master's degree in mathematics and was a former lecturer at the University of Yangon.

[169] Monywa, which is a major port on the Chindwin River, is linked by rail to Mandalay in the east (via Chaung U); Pakokku in the south (also via Chaung U); and Ye-U and Khin U in the north.

8.13 A Line from Sittwe to Minbu

An important new line that may be built in the rural regions is one from Sittwe to Minbu via Ann.[170] Sittwe is the capital of Rakhine State, and Ann is also located within the state. In late 2013 when I was in Minbu, the Station Master told me that construction of the line from Minbu to Ann was cancelled, because of a lack of funds. However, it may now be back on the agenda as discussed below. This is one of the thirteen lines listed in Table 4 in Chapter 1. In January 2015 an RBE service resumed in Sittwe on a line 11.5 miles long, from Sittwe to Yechanbyin.[171] The line services two universities in Sittwe, Technological University and Sittwe University. At the re-opening of the line which had been closed since 2012 due to unrest in the region, the then Minister for Rail Transportation, U Than Htay, stated that this line was the first section of the Sittwe-Ann-Minbu line, indicating that the construction of this line was back on Myanma Railways' agenda. The route from Sittwe to Minbu via Ann is shown in Map 36 below.[172]

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[170] An alternative spelling for "Ann" is "An".

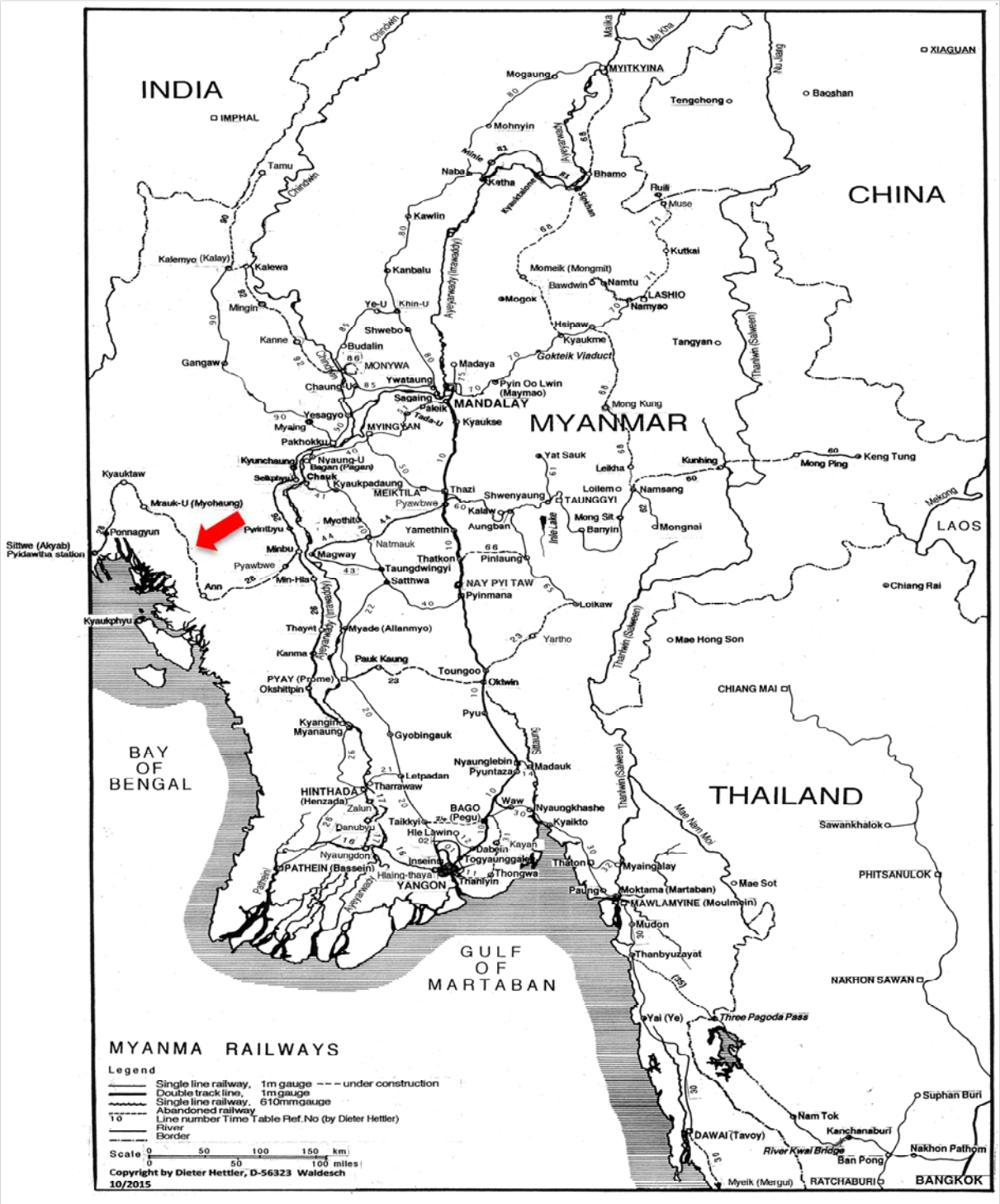
[171] *The Global New Light of Myanmar*, (2015, January 26), *op. cit*.

[172] This map was kindly supplied by Mr Dieter Hettler who has given permission for it to be reproduced here. An earlier version (see Map 8) appeared in:

Hettler, (2013, August), *op. cit.*

Hettler has developed his own system for numbering lines in the Myanma Railways network (both existing and ones that may be built in the future). The Sittwe to Minbu line is #28 on this map. This map produced by Hettler is not without its flaws. For example, for line #60, there is no line from Kengtung to Mong Ping, and no line under construction from Mong Ping to Namsang. A line from Mong Ping to Namsang was announced by Myanma Railways in 2009, but never started (see Chapter 7). Similarly for line #68, there is no line under construction from Myitkyina in Kachin State to Kyaukme in Shan State. This also was announced by Myanma Railways (in 2010) but never started. I have seen a large display map of the line in a Myanma Railways building near Hsipaw (near the Hsipaw-Laikha-Namsang line where construction started but was quickly abandoned). See:

Stubbs, (2012, November 26), *op. cit.*



Map 36: A map of Burma showing the planned line from Sittwe to Minbu.

The Sittwe to Mrauk U section of the Sittwe-Ann-Minbu line is being built, and when opened should be popular with tourists (both domestic and foreign) who travel from Sittwe to Mrauk U (usually by boat) to visit the famous pagodas in Mrauk U.[173] The

[173] Maung Maung Myint Swe, (2017, May 13), "Towards peaceful and developing Rakhine", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-05-13-red.pdf.

proposed line from Sittwe to Minbu is 257 miles long. The Sittwe-Yechanbyin section, the Kwantaung-Ponnagyun-Yotayoke section, and the Yotayoke-Kyauktaw section have been completed.[174] This is a total length of 53.5 miles. Table 63 below list the sections that have been opened as well as the sections yet to be built.[175]

Section	Length (Miles)	Starting Date	Opening Date
Opened Section			
Sittwe - Yechanbyin	11.5	15 February 2009	19 May 2009
Kwan Taung - Ponnagyun - Yotayoke	22.7	15 February 2009	15 May 2010
Yotayoke - Kyauktaw	19.3	15 February 2009	10 April 2011
	53.5		
Sections to be Opened			
Yechanbyin - Pardaleik	5.8	15 February 2009	
Pardaleik - Kwan Taung	4.2		
Kyauktaw - Ann - Minbu	193.0		
	256.5		

Table 63: Sections of the proposed Sittwe – Ann - Minbu Railway.

One matter of concern with the railway is that it was planned to pass through Mrauk U, an important heritage site with many ancient pagodas. In 2010, there was concern that some pagodas had been damaged by railway construction.[176] There were protests by local residents, resulting in the railway construction being suspended in March 2014.[177] The railway was running through the Wethali and Danyawaddy cultural zones in Mrauk U.[178] This section of the line through Mrauk U is now apparently abandoned:[179]

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[174] *The New Light of Myanmar*, (2010, May 16), "National Railway Network will emerge in the near future, Government giving priority to smooth and secure rail transportation playing an important role in passengers and commodity transport. Kwantaung-Ponnagyun-Yotayok railroad section in Ponnagyun opened." Retrieved from: http://www.burmalibrary.org/docs08/NLM2010-05-16.pdf; and

The Global New Light of Myanmar, (2015, January 26), *op. cit*.

Yotayok can be spelt either as "Yotayok" or "Yotayoke".

[175] *Ministry of Rail Transportation*, (2015, November 23), *op. cit*.

[176] Khin Oo Thar, (2010, November 24), *op. cit*.

[177] *Mizzima*, (2014, July 29), "International archaeologists will be invited to assess Mrauk U railway project". Retrieved from: http://archive-3.mizzima.com/mizzima-news/development/item/11939-international-archaeologists-will-be-invited-to-assess-mrauk-u-railway-project/11939-international-archaeologists-will-be-invited-to-assess-mrauk-u-railway-project.

[178] *Ibid*.

[179] *Lonely Planet*, (2017, July), *op. cit*., p.325.

The elevated track that runs adjacent to Wethali is in fact an abandoned railway line. A rare incidence of the former military government bowing to popular opinion occurred here in late 2010, when a few brave locals protested against the planned route of a new railway linking Sittwe with Minbu, the construction of which was damaging temples and sites within the archaeological area. The project was halted and the railway's route changed.

Since 2014, there has been no further suggestion that the railway will pass through Mrauk U.

The rail line from Sittwe, if it is eventually extended to Ann and Minbu, will not be the first one in Rakhine State. In the early 1900's a narrow-gauge railway was constructed between Buthidaung and Maungdaw in northern Rakhine State, a railway known as the Arakan Light Railway. This line, which closed down in 1927, is discussed in the next section of this chapter.

8.14 The Arakan Light Railway

The final section of Chapter 8 delves back into the past to briefly discuss a light railway from nearly one hundred years ago in Burma, the Arakan Light Railway.

The modern railway from Sittwe to Ann in Rakhine State, if it is ever completed, will not be the first railway in that state. In the early 1900's a narrow-gauge railway was constructed between Buthidaung and Maungdaw in northern Rakhine State, a distance of just over eighteen miles.[180] The line is shown in Maps 37 and 38 below.[181]

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[180] Ye Khaung Nyunt, (2016, November 14), "Transportation between Buthidaung and Maungtaw has improved", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs23/GNLM2016-11-14-red.pdf; and

Ford, Jan, (2015, August 16), "The Arakan Light Railway", *Jan Ford's World* website. Retrieved from: http://janfordsworld.blogspot.com.au/2015/08/the-arakan-light-railway.html; and

Hughes, (1994), *op. cit.,* p.14; and

Win Thein, (2014, November 1), "There is no railway in Rakhine State", *Myanmar Folks* website. Retrieved from: http://mgnyotdg.blogspot.com.au/2014/11/there-is-no-railway-in-rakhine-state.htm; and

Parkes, Kelvin, (1993, January), "The Arakan Light Railway", Indian Railways Study Group Newsletter, Vol. 8, pp.2-9.

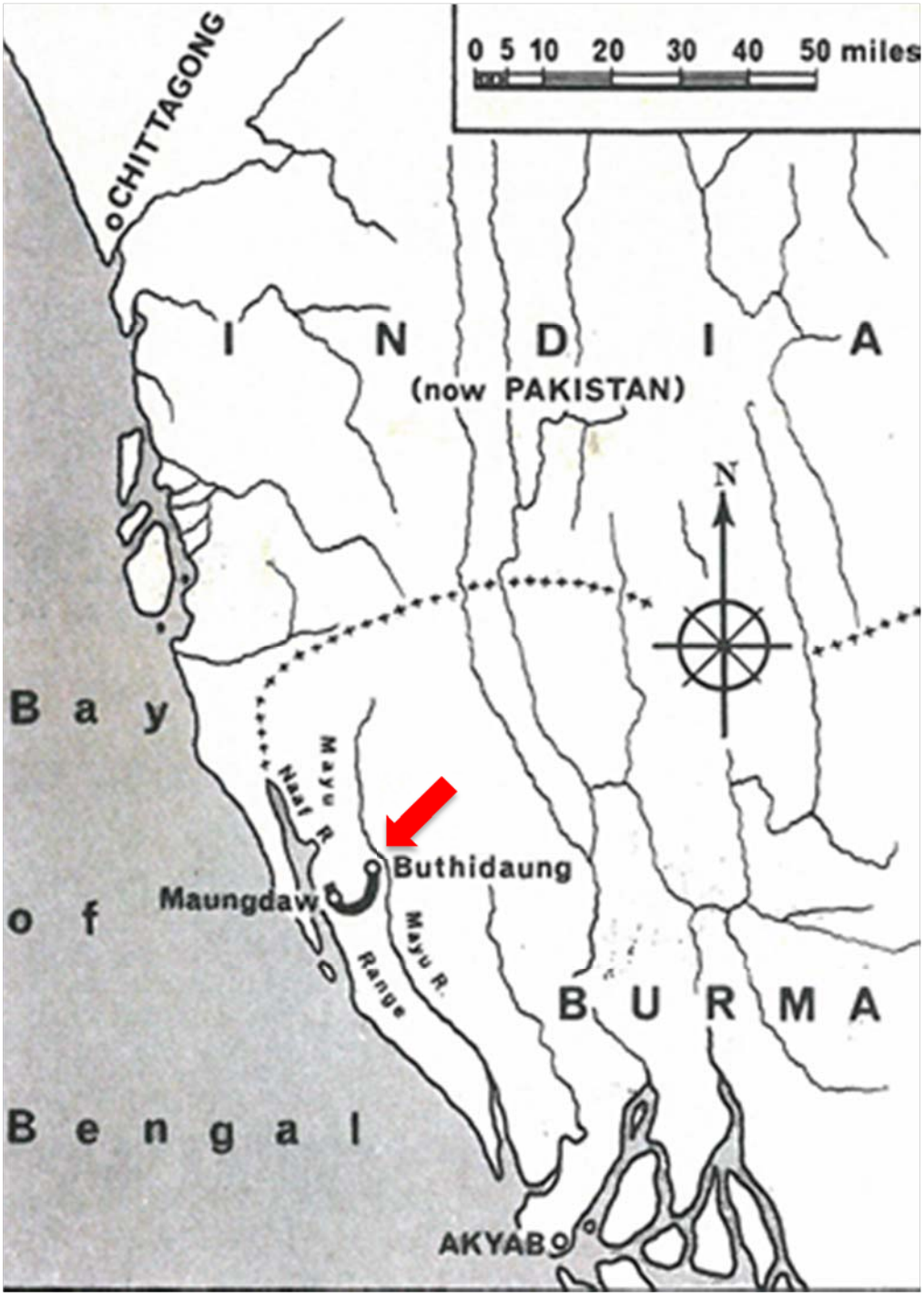
The newsletters of the Indian Railways Study Group are held by the British Overseas Railways Historical Trust, in London, UK.

[181] Map 37 is sourced from:

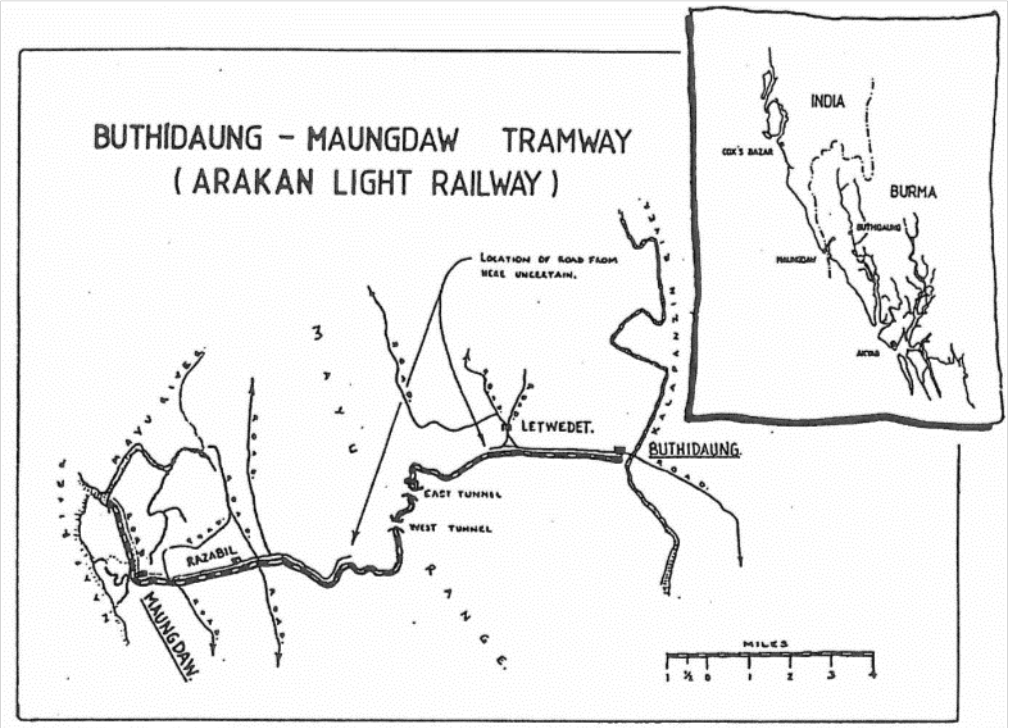
Hughes, H.C., (1966, November), "Garratts in Arakan Railway", Railway Magazine, Vol. 112, No. 787, pp.24-25.

Map 38 is sourced from:

Parkes, (1993, January), *op. cit.*



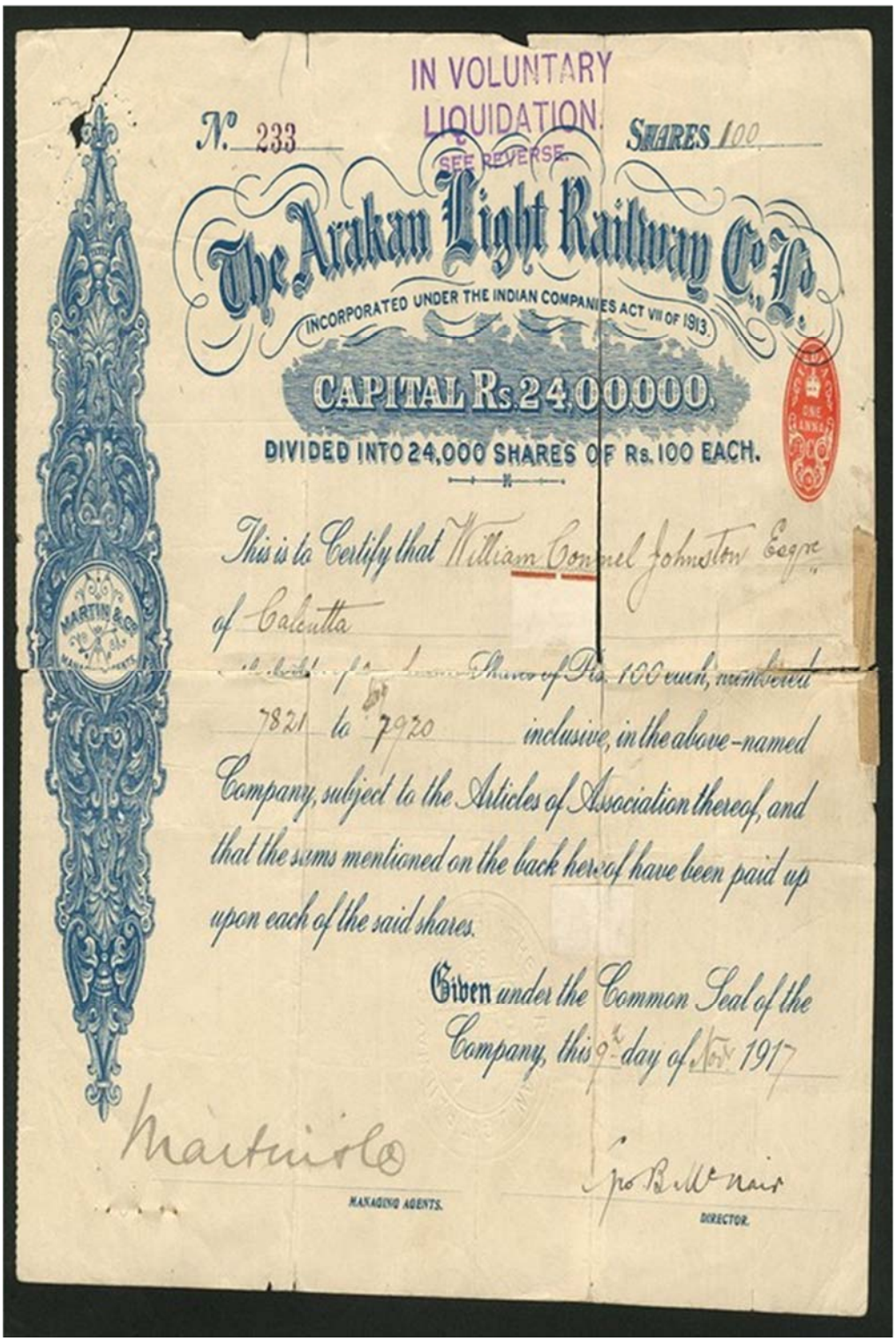
Map 37: The route of the Arakan Light Railway, from Buthidaung to Maungdaw.



Map 38: The Arakan Light Railway.

The Buthidaung-Maungdaw Tramway Company was founded in March 1913 by the Arakan Flotilla Company to build this line. In October 1916, Martin's Light Railway Company of Calcutta registered the Arakan Light Railway Company in order to purchase and complete the line. A share certificate issued by the Arakan Light Railway Co. Ltd is shown in Plate 170 below.[182]

[182] This photograph is from the website of the UK auction house, Spink. See: *Spink* website, https://www.spink.com/lot-description.aspx?id=13017000298.



IN VOLUNTARY LIQUIDATION.
SEE REVERSE.

No. 233 SHARES 100

The Arakan Light Railway Co. Ld.

INCORPORATED UNDER THE INDIAN COMPANIES ACT VII OF 1913.

CAPITAL Rs. 24,00000.

DIVIDED INTO 24,000 SHARES OF Rs. 100 EACH.

This is to Certify that William Connel Johnston Esqre of Calcutta

[illegible] Shares of Rs. 100 each, numbered 7821 to 7920 inclusive, in the above-named Company, subject to the Articles of Association thereof, and that the sums mentioned on the back hereof have been paid up upon each of the said shares.

Given under the Common Seal of the Company, this 9th day of Nov. 1917

Martin & Co

MANAGING AGENTS.

Jno Bell McNair

DIRECTOR.

Plate 170: A share certificate issued by the Arakan Light Railway Co. Ltd. In 1917.

The Arakan Light Railway Company had support from the Governments of India and Burma as well as from the Arakan Flotilla Company. The gauge of the railway was 2 *ft* 6 *in*, which was the gauge preferred by the key consultant to the line, Mr Everard Calthrop, who was a British railway engineer. Calthrop commissioned the railway engineering firm Beyer, Peacock & Company Ltd in the United Kingdom to

build two 0-6-0 + 0-6-0 Beyer Garratt locomotives for the line.[183] These were the smallest Garratt locomotives ever built by Beyer Peacock.[184] One of the two locomotives is shown in Plate 171 below.[185]

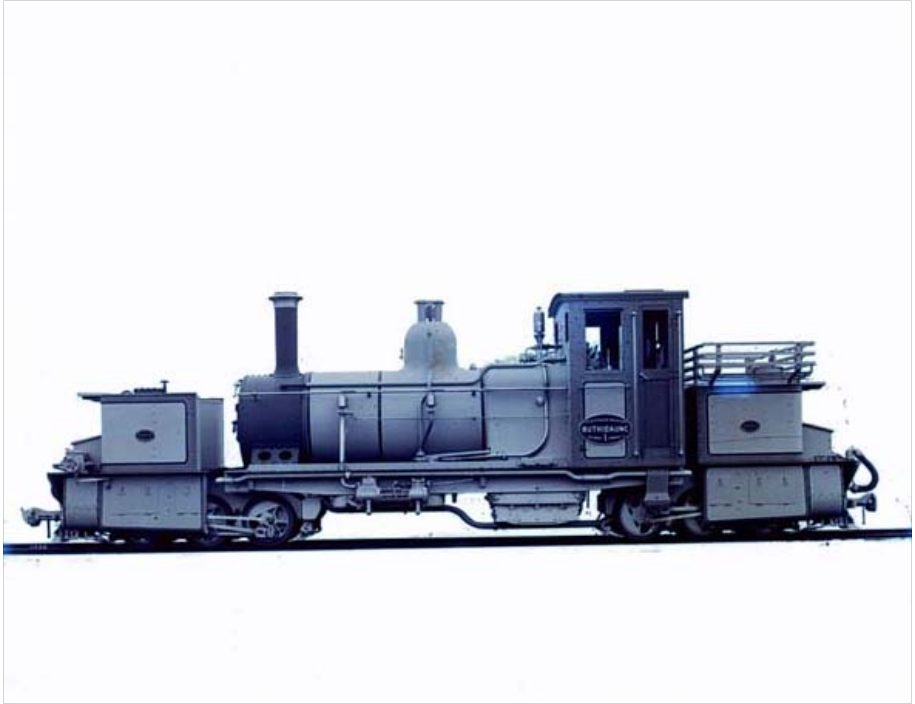


Plate 171: One of the two Garratt locomotives built for the Arakan Light Railway.

On the line there were two tunnels, which are today used for road transport.[186] The reasons for the construction of the line were:

- To improve communications in this remote area near Burma's border with what is now Bangladesh.[187]

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[183] The notation '0-6-0 + 0-6-0' is known as Whyte notation and represents the wheel arrangement in an articulated steam locomotive.

[184] Durrant, A.E., (1969), "The Garratt Locomotive", David & Charles, Newton Abbot, Devon, pp.46-47; and

Durrant, A.E., (1981), "Garratt Locomotives of the World", Book Club Associates, London, pp.58-60; and

Hughes, (1966, November), *op. cit*.

[185] This photograph is sourced from the website of the Museum of Science & Industry in the UK. See:

Museum of Science & Industry website, http://emu.msim.org.uk/htmlmn/collections/online/imagesdisplay.php?irn=30499&QueryPage=%2Fhtmlmn%2Fcollections%2Fonline%2Fsearch.php&section=.

The locomotive in the photograph bears the name "Buthidaung" and was works number 5702 from Beyer Peacock. The locomotive was built in 1913. See:

Hughes, (1966, November), *op. cit.*, p.25.

[186] Ye Khaung Nyunt, (2016, November 14), *op. cit*.; and

Win Thein, (2014, November 1), *op. cit*.

[187] Ford, (2015, August 16), *op. cit*.;

- To transport coolies from Chittagong into Arakan to work on the rice harvest.[188]
- To transport rice from Maungdaw to rice mills in Akyab (the modern-day Sittwe).[189]

The line opened for operation on 15th February 1919 but unfortunately was not profitable as annual expenses were consistently twice annual earnings.[190] The company eventually went into voluntary liquidation.[191] The line was acquired by the Government of India from the liquidators and was closed in 1926, and then dismantled.[192] No trace of the line remains today.

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[188] *Ibid*.

[189] Win Thein, (2014, November 1), *op. cit.*

[190] Hughes (1994), *op. cit*., p.14

[191] *Wiki.fibis.org* website, "Arakan Light Railway". Retrieved from: http://wiki.fibis.org/index.php/Arakan_Light_Railway; and

Hughes, (1994), *op. cit*., p.14.

"*In voluntary liquidation*" can be seen stamped on the share certificate shown in Plate 170.

[192] *Old Martinians' Association*, "Burma's Railway System", *Old Martinians' Association* website. Retrieved from: http://www.oldmartiniansassociation.co.uk/documents/BURMARAILWAY.pdf.

Chapter 9

CONCLUSION

9.1 Introduction

This concluding chapter will first summarise the key results of the thesis; briefly examine whether the branch-line operations of Myanma Railways should be subsidised by more profitable areas; consider the issue of the quality of the Myanma Railways staff; and lastly propose areas for future possible research.

9.2 The Key Results of this Thesis

An empirical approach has been at the core of this thesis, which has looked at the railways in Burma from three key perspectives. The first was by taking a historical approach examining how the railways in Burma have performed over a number of years, particularly since World War II, as was discussed in Chapter 3. Another perspective has been to ask what the railways are really like to travel on, and this has been served by the case studies on the Kyangin-Pakokku line and the line from Aungban to Loikaw, as well as evidence from travel around the rest of the Myanma Railways network. The third perspective has been to ask what is planned for the future, and this covers a number topics, most of them entwined with the current political situation in Burma. The bigger issues are ones such as the proposed China-Burma Railway; potential links to India and Thailand; and the improvement of the suburban railway in Yangon.

The need for significant improvement in the railways in Burma is self-evident, but for this and many other improvements and reforms to happen in Burma, a change of government in Nay Pyi Taw was essential. This has happened. The quasi-military government of President U Thein Sein was an improvement over the despotic juntas of Ne Win or Than Shwe, but until a full transition to democracy is achieved and a resolution of the ethnic issues in Burma occurs, there is little hope of significant improvement in the railway network. Burma should be able to have a rail network of a comparable standard to Thailand or Malaysia, but it needs a much stronger economy to achieve this. As is so often the case in the recent history of Burma, genuine improvement in Burma – be it in the railways, health,

education or many other areas – genuine and lasting improvement relies on moving on from the former quasi-military government of Thein Sein and the military governments prior to that which had ruined Burma over many decades. A common theme emerging from the statistical overview in Chapter 3 and the two case studies in this thesis is the lack of funds for improving the railways: the rolling stock is old; the track and stations are often in a state of disrepair. The reason is simple: too much of the national budget is wasted on the military. Until the spending on the military is reined in and a proper budget implemented, rural areas especially will be forced to endure a significantly below-standard railway service. Sadly, the people living in these areas know no better.

The country was under military rule from 1962 when General Ne Win staged a coup-d'état to take control of the country. In 2015 Aung San Suu Kyi led the National League for Democracy to a historic victory in national elections, and subsequently formed a democratic government, albeit with the military still having ultimate power. During these 53 years (1962-2015) the military failed to build the nation. Indeed, the nation went backwards. This is reflected in the under-investment in the railways in the country. Chapter 3 contains many graphs of economic statistics relating to the railways. Some graphs, such as ones of the number of railway stations or route length, show strong growth, but as has been discussed many of the stations are very poor, and some are indeed not worthy of being called a station, and much of the track is very poor, especially on "new lines". The key graphs that measure the growth (or lack thereof) of Myanma Railways are graphs of items such as passenger numbers and freight transported. Nothing is more illustrative of this than the graph of passenger numbers, which was shown in Figure 5 and is reproduced below in Figure 69.

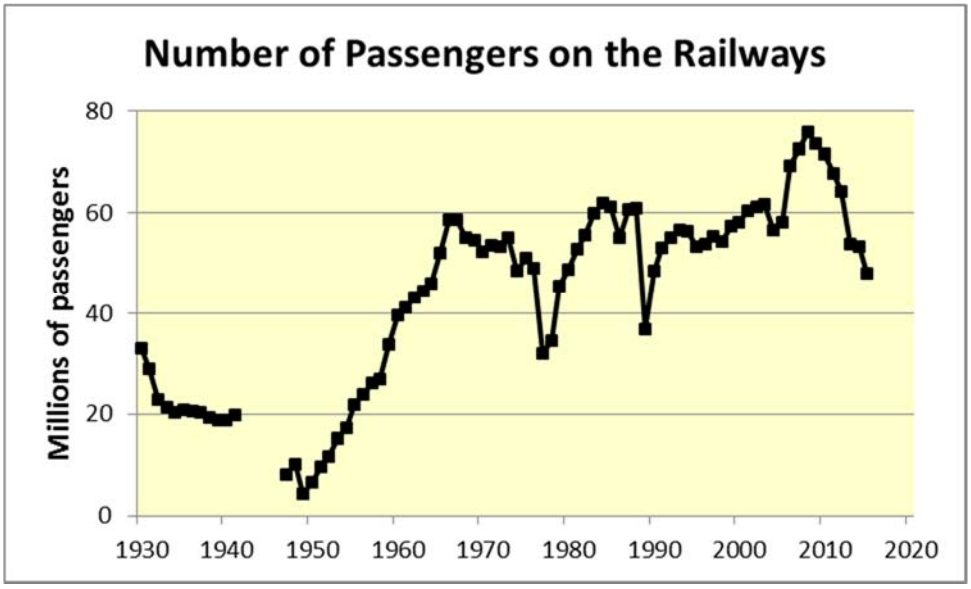

Figure 69: The number of passengers travelling on the railways in Burma.

The overall growth in passenger numbers from about 1960 to now is legible. The population has grown, but Myanma Railways has not provided the type of services for passengers or freight that is needed. The military has looked after itself, to the detriment of the country.[1]

The conclusion to draw from this thesis is that Myanma Railways is in a bad state, providing neither a good passenger service nor a good freight service. There is so much development happening in Burma at present as the country transitions to democracy that sometimes the railways seem to be overlooked. There is much fanfare in the press about new roads being built, new airports and Special Economic Zones (SEZ's) such as at Dawei, Kyaukphyu or Thilawa near Yangon. It is surprising that Aung San Suu Kyi has not spoken out on the need to rehabilitate and improve the rail network in Burma.[2] However worldwide there has been a realisation of the importance of railways to today's economies, and hopefully the new NLD government will recognise this as well. It will probably take at least

[1] In many ways, this was brought home to me when I was in Kalaw in January 2018. I spent a part of the day at or near the railway station on 30th and 31st January. Four Myanma Railways passenger trains pass through the station each day, hauled by old locomotives of the DF 2000 class. On 31st January the No. 147 Up service from Thazi to Loikaw was running three and a half hours late as its locomotive, DF.2001 (an old French locomotive manufactured by Alsthom), had broken down. The No. 147 Up service had been scheduled to depart from Thazi at 3:00am arriving at Thazi at 9:25am. On this day it arrived at 12:50pm. The other train I saw was the military train shown in Plate 10 in Chapter 3: a brand-new locomotive DF.2086 hauling small five new goods wagons. The travelling public on this line has to put up with old and unreliable rolling stock, while the military has the newest available. Unfortunately, this sums up the military's attitude to the general population in Burma as a whole.

[2] This is not meant as a criticism of Aung San Suu Kyi, as she is grappling with many significant issues on a number of fronts, especially the Rohingya issue in Rakhine State.

twenty years to develop the railways in Burma to a satisfactory standard – and so much rests on a full transition to democracy – but the country will benefit greatly if significant improvement and development can be achieved on the railways in Burma.

9.3 Should the Branch-Line Operations of Myanma Railways be Subsidised by More Profitable Areas?

Myanma Railways is struggling, both financially and at the operational level, with ageing rolling stock, inferior track and poor signalling equipment. Losses have risen from Kyat 12.5 billion (about US$10.3 Million) in 2006-2007, to Kyat 65.4 billion in 2014-2015.[3] The new NLD government is looking to privatise struggling state-owned enterprises such as Inland Water Transport, but it is highly unlikely that Myanma Railways will be privatised as entrepreneurs are thought to see little profit in taking Myanma Railways over.[4]

A key issue the government needs to face with the railways is the state of its branch-line operations, and whether the railways in these smaller lines should be subsidised by other parts of the network. They may be small in length or small in the number of passengers or volume of freight transported. In August 2016, Myanma Railways closed sixteen short routes in rural areas in order to save costs.[5] The ministry said it was losing K205,000 per day in daily revenues from 843 passengers but saving K900,000 in daily expenditures (described as being 299 gallons of petroleum). This is a net loss of K695,000 per day or approximately US$535 per day.[6] Per passenger, this is K824/day or approximately US$0.65 per passenger per day. The total loss per annum is approximately K0.25 billion or approximately US$200,000, which is not large compared to the overall loss that Myanma Railways is incurring. Short routes such as Wetlet-Kalaymyo and

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[3] Htoo Thant, (2016, September 19), "Farmers displaced by Bago railway to be compensated. Line still suspended", Myanmar Times. Retrieved from: http://www.mmtimes.com/index.php/national-news/nay-pyi-taw/22578-farmers-displaced-by-bago-railway-to-be-compensated-line-still-suspended.html.

[4] *Ibid*.

[5] Htoo Thant, (2016, August 18), *op. cit.*

[6] Assuming an exchange rate of approximately K1,300 = US$1, which was where the exchange rate was in November 2016. See:

Kyaw Hsu Mon, (2016, November 17), "Dollar Exchange Rate Climbs, Shakes Up Burma's Business Community", The Irrawaddy. Retrieved from: http://www.irrawaddy.com/business/dollar-exchange-rate-climbs-shakes-up-burmas-business-community.html.

Monywa-Tiddim were closed. Some of these short rural routes are serviced by LRBE's hauling box-car carriages (such as shown in Plate 21 in Chapter 3). The train in Plate 21 was in fact departing from Kalaymyo Station.

If Myanma Railways could provide a better quality of service, there would be greater patronage of these short-route services. The track needs improving (for example, the Pakokku-Kyangin line), the rolling stock needs improving (e.g. on the line from Taunggyi to Saikkhaung), and the facilities (such as the stations) need improving. These rural services should be subsidised, and secondly the quality of service needs to be improved.

9.4 Myanma Railways: The Quality of Staff Needs to be Improved

As with any organisation, the quality of management and staff are key to its success. Seiler has made some very apt observations on a fundamental problem within Myanma Railways:[7]

> *Many soldiers who left the army went to the state railway because it's a state owned company. Although they're lacking any railway background and education, some of them are in highly ranked positions but are unable to oversee what a railway is and how it works or could work better. The real railwaymen find it sometimes difficult to do what is necessary. Hence the railways are inflexible and don't react to the changing world around them.*

At the station level, I have seen staff who seem to have little to do, and sometimes have another job elsewhere. The culture and quality of staff at Myanma Railways must be improved if the railway itself is to improve. The public sector in Myanmar has a problem with too many ex-soldiers employed in positions beyond their ability. This problem is not unique to Myanma Railways.

9.5 Future Possible Research

It is traditional in a thesis to suggest other lines of future research. One topic only just touched on in this thesis is the question of gauge. Myanma Railways is burdened with a metre-gauge system, a legacy of the British, a gauge Garver has described as "antiquated".[8] Standard-gauge lines will probably eventually be built for the international links to China and Thailand, but probably not to India given

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[7] Seiler, (2017, February 4), *op.cit.*

[8] Garver, (2001), *op. cit*.

Indian Railways' usage of broad gauge throughout its vast network. The bigger question is should the whole network convert to a 1,435 *mm* gauge (standard gauge), or indeed to the broad gauge (1,676 *mm*) that India uses? Longer term, this is probably the best thing Myanma Railways could do to put the rail network in Burma on a solid footing for the decades ahead. Is it feasible or practical to do so, does it make economic sense? These are issues worthy of further consideration, but have been outside the scope of this thesis.[9]

The second possible area of study is to examine what has happened to the Inland Water Transport department since Independence in 1948. The Irrawaddy Flotilla Company fleet was scuttled by the British when the Japanese invaded Burma at the end of 1941 and in early 1942. Following victory over Japan, the company started operating again after World War II, only to be nationalised some years later. This thesis has compared activity on the railways to the inland waterways in Burma. However, the inland waterways deserve closer study and attention, in order to understand and explain their decline as a part of transport infrastructure in modern-day Burma. The fall in passenger numbers, freight, passenger-miles and freight ton-miles has been dramatic. Passenger-miles on the inland waterways on a monthly basis in Burma are shown in Figure 70 below, for the period April 2012 to September 2016.[10] The figure has fallen steadily from an average of 18,900 passenger-miles per month for the first six months of the year ended 31st March 2013 to just 3,800 passenger-miles per month for the first six months of the year ended 31st March 2017.

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[9] The suggestion of converting the whole network of Myanma Railways to standard gauge or Indian broad gauge may sound fanciful, but as mentioned in §4.4.3 in Chapter 4, in Victoria in Australia 1,000 *km* of Irish broad gauge (1,600 *mm*) track is being converted to standard gauge. But this track is used for freight not passenger traffic. In Burma, gauge conversion would be much harder because of passenger traffic being the main business.

[10] These are the same figures shown in Figure 55 in Chapter 3, where figures were presented separately for each year in order to show any seasonal patterns.

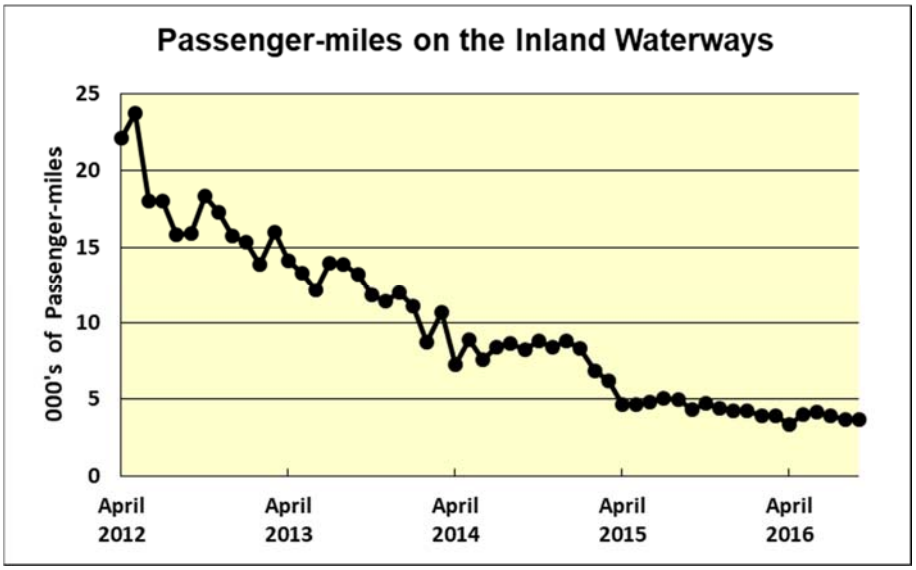

Figure 70: Passenger-miles on the inland waterways, on a monthly basis.

If the government cannot profitably operate an inland water transport department, is there an alternative such as providing better infrastructure support on the waterways (notably the Irrawaddy River, the Salween River and the Chindwin River, as well as in the Irrawaddy Delta) for the private sector? The role of inland waterways in other countries such as India could be a useful comparison. The new NLD government is addressing the issue, being very conscious that reform is needed as Inland Water Transport is running at a loss. The Asian Development Bank is supportive of river transport as an important component of the country's transportation system, stating:[11]

> *River transport could become the preferred transport alternative for low-value freight between Yangon and Mandalay, with improvements to navigation channels and terminals having the potential to cut Myanmar's river transport costs.*

Privatisation or corporatisation of the Inland Water Transport department is a real possibility.[12] In a report on the performance of the Ministry of Transport and Communications in the first year of the NLD government, the minister (U Thant Zin Maung) is quoted as saying that in the future the Chindwin Water Transport Corporation, the Ayeyawady Water Transport Corporation and the Rakhine Water Transport Corporation will emerge under public companies or joint ventures.[13] There are also plans to build container wharves at Bhamo, Mandalay, Pakokku

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[11] *Asian Development Bank*, (2016, July), "Myanmar Transport Sector Policy Note: River Transport". Retrieved from: https://www.adb.org/publications/myanmar-transport-sector-policy-note-river-transport.

[12] Aung Thant Khaing, (2016, April 10), *op. cit.*

[13] Nandar Win, (2017, March 26), *op. cit.*

and Magway on the Irrawaddy River and at Monywa and Kalewa on the Chindwin River.[14] It appears as if the government has determined there is a future for inland water transport in Burma. There is ample scope for research on this topic, including a historical study.

A third area of research could be a study of the early days of the railways in Burma during the colonial period, say from 1877 to 1920, or perhaps to 1941, when Japan invaded the country. The first line was built from Rangoon to Prome in 1877. Detailed statistical data on the railways' operations are available in reports entitled *Administration Report on the Railways in India* or *Report to the Secretary of State of India*, as briefly discussed in Chapter 3. Such a study was beyond the scope of this thesis, but could be of value from an economic history point of view.

A small research project could be to delve further into the viability and value of a tram or light rail system in Yangon and Mandalay, and perhaps even Nay Pyi Taw. The early history of trams in both Rangoon and Mandalay has been very well documented by Sechler.[15] The attempt in 2016 to set up tram operations in Yangon was flawed, as discussed in Chapter 8. Further research into the viability, practicality and economic benefits of a tram or light rail system in Yangon would be of value, as well as an examination of the possibilities in Mandalay.

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[14] *Ibid.*

[15] Sechler, (2000), *op. cit.*

Epilogue

It is probably unusual for a thesis to have an epilogue, but events unfolding in Burma at present suggest it is necessary. The national election on 8th November 2015 saw a commanding victory to the National League for Democracy, led by Aung San Suu Kyi. Such was the scope of the victory, the National League for Democracy was able to form a government to run the country, unlike after the elections in 1990 when it was denied this right by the military.

Disconcertingly, in late 2016 and continuing into 2017 there has been much violence in northern Rakhine State and ethnic unrest, as well as clashes with the Tatmadaw in northern Shan State. This has raised the spectre of a military take-over of the country again. In late November 2016 the head of Burma's military, Senior-General Min Aung Hlaing, openly discussed the clause in the 2008 Constitution that allows the military to stage a coup in the event of chaos and instability.[1] The 2008 Constitution was drafted by the military. There are those who think that it may be the military stirring up trouble in Rakhine State and Shan State in order to justify a coup.

From a railway point of view, the ongoing violence in Rakhine State is a concern, as it will affect any railway development in the region. In August 2017, thousands of Rohingyas were reported to be fleeing to Bangladesh to escape the violence in Burma.[2] Bangladeshi border guards were turning many of them back.[3]

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[1] *The Irrawaddy*, (2016, November 28), "Military Chief Mentions State of Emergency Provisions Amid Ongoing Clashes". Retrieved from: http://www.irrawaddy.com/news/burma/military-chief-mentions-state-of-emergency-provisions-amid-ongoing-clashes.html.

[2] Paul, Ruma, (2017, August 27), "Gunfire heard near Bangladesh border as thousands flee Myanmar violence", Reuters. Retrieved from: https://www.reuters.com/article/us-myanmar-rohingya-idUSKCN1B706O?il=0; and

Moe Myint, (2017, August 27), "Muslim Militants Targeted Civilians in Rakhine: Govt", The Irrawaddy. Retrieved from: https://www.irrawaddy.com/news/civilians-targeted-rohingya-militants-violence-continues-rakhine.html; and

The Republic of the Union of Myanmar, Anti-terrorism Central Committee, (2017, August 28), "Arakan Rohingya Salvation Army (ARSA) Declared as Terrorist Group", The Global New Light of Myanmar, p. 1 and p.7. Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-08-28.pdf.

Just over a week after violence erupted in Rakhine State, the United Nations was estimating that 58,000 Rohingya refugees had crossed to Bangladesh, and that a further 20,000 Rohingyas were stuck along the Naf River which forms the border between Burma and Bangladesh. See:

BBC News, (2017, September 2), "Myanmar conflict: Bangladesh police allow Rohingya to flee". Retrieved from: http://www.bbc.com/news/world-asia-41135727.

[3] *BBC News*, (2017, August 28). "Myanmar Rakhine: Thousands flee to Bangladesh border". Retrieved from: http://www.bbc.com/news/world-asia-41067747.

Burma and Bangladesh each regard the Rohingyas as the other country's citizens. Police outposts were attacked by Rohingya insurgents in northern Rakhine State on 25th August 2017, with 98 deaths being reported, including nearly 80 insurgents and 12 members of the security forces.[4] Two days later, there were reports of 130 Rohingyas being massacred by Myanmar security forces and Buddhist vigilantes in the village of Chun Pyin.[5] There are also reports of over twenty Rohingyas drowning as they tried to flee by sea to Bangladesh to escape the violence in Rakhine State.[6] The treatment of the 1.1 million Muslim Rohingyas in Rakhine State is becoming the biggest challenge facing Aung San Suu Kyi and her NLD government.[7] A week after the initial attacks on the police outposts it was being reported by the Tatmadaw that 400 people had been killed. The Tatmadaw claimed those killed were mostly Rohingya insurgents.[8] In this climate, any work on the railway between Sittwe and Minbu via Ann is unlikely to go ahead, and any rail link between Bangladesh and Burma is highly unlikely in the foreseeable future, given the political tensions between the two countries.

So where do the railways fit into this emerging democracy that is Burma? There are many demands on Aung San Suu Kyi's time to lead the country: she must juggle the linkages with the former regime; the overseas investors wishing to invest in Burma; and the ethnic issues within the country and the ongoing unrest in states such as Rakhine State, Shan State and Kachin State. In this context, the

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[4] *ABC News,* (2017, August 27), *op. cit*.; and

The Irrawaddy, (2017, August 25), "State Counselor Condemns Attacks in Rakhine". Retrieved from: https://www.irrawaddy.com/news/burma/state-counselor-condemns-attacks-rakhine.html; and

The Global New Light of Myanmar, (2017, August 26), "Extremist terrorists attack on police outposts in N-Rakhine". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-08-26.pdf; and

The Global New Light of Myanmar, (2017, August 27), "Security increased for ongoing terrorist attacks in N-Rakhine". Retrieved from: http://www.burmalibrary.org/docs23/GNLM2017-08-27.pdf.

[5] Cochrane, Liam, (2017, September 1), "Villagers slaughtered in Myanmar 'massacre', reports of women and children among more than 100 dead", ABC News. Retrieved from: http://www.abc.net.au/news/2017-09-01/reports-of-women-and-children-among-dead-in-myanmar-massacre/8862164.

[6] *BBC News,* (2017, August 31), "Myanmar Rakhine: Rohingya refugees drown as exodus mounts". Retrieved from: http://www.bbc.com/news/world-asia-41105292.

[7] Cochrane, (2017, August 29), *op. cit.*

[8] *Reuters,* (2017, September 1), "Nearly 400 die as Myanmar army steps up crackdown on Rohingya militants". Retrieved from: http://www.reuters.com/article/us-myanmar-rohingya/nearly-400-die-as-myanmar-army-steps-up-crackdown-on-rohingya-militants-idUSKCN1BC3T8; and

ABC News, (2017, September 2), "Rohingya clash with Myanmar's security forces at border claims almost 400 lives". Retrieved from: http://www.abc.net.au/news/2017-09-02/rohingya-clash-in-myanmar-claims-400-lives/8866492.

railways are not high on her agenda. Issues such as health, education and the sorting out of the ethnic tensions are of much greater importance.

The railways in Burma are changing. This change began under the regime of President Thein Sein and will probably continue. The focus is in two areas. The first is the upgrading of the Yangon to Mandalay line: not just the track but also the rolling stock. The second is the upgrade of the Circular Railway in Yangon, and especially the addition of new rolling stock, improved ballasting, improved stations and improved signalling equipment. Yangon is of course an important area of focus, and it is appropriate that efforts be made to improve the suburban railway system in a city that is congested with traffic.

The rural lines operated by Myanma Railways are badly in need of improvement. Not all decisions made with respect to the operations of Myanma Railways will be for the good in my opinion. In late 2015, Myanma Railways announced that it was planning to sub-contract faltering rural services.[9] This is because these services are operating at a loss. To bring the private sector in to operate these lines, assumedly to try to make a profit, is folly. The suburban railway and the main-line operations (i.e. Yangon-Mandalay) of necessity need to subsidise the rural operations.[10] Myanma Railways and the new NLD government would be well advised to leave all railways in Burma under the control of Myanma Railways.

The proposed China-Burma Railway barely gets a mention in the press these days, and is does not seem to be high on the agenda of the new NLD government. Under the former regimes of Ne Win and Than Shwe the imposition of sanctions on Burma, especially by the US, pushed Burma "into the arms of China".[11] Burma is wary of China, and President Thein Sein's suspension of the construction of Myitsone Dam signalled this. In the same vein, a Burma with an NLD government will probably also be wary of China. The fact that sanctions have been lifted

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[9] Aye Min Soe, (2015, December 8), "First-Class decision. Myanma Railways to sub-contract faltering train services", The Global New Light of Myanmar. Retrieved from: http://www.burmalibrary.org/docs21/GNLM2015-12-08-red.pdf.

[10] This is a topic well beyond the scope of this thesis.

[11] Turnell, Sean, (2015, December 9). Quoted in:

Ramzy, Austin (2015, December 9), "Myanmar Political Shift Revives Debate on Sanctions", The New York Times. Retrieved from: http://www.nytimes.com/2015/12/09/world/asia/myanmar-sanctions.html?_r=0.

suggests Burma does not need to accede to any push from China to construct the China-Burma Railway, the benefits of which mostly accrue to China.[12]

Longer term, the construction of a modern suburban railway in Yangon (possibly in conjunction with a tram or light rail service) will probably be the main issue that the new government will need to address on railway infrastructure. But it should work to upgrade the rural lines - the track, the stations and the rolling stock. The new government must be wary of directing the bulk of infrastructure spending to roads and new highways. There are tremendous benefits from a modern rail system – both suburban and rural – and this should not be overlooked by the new government. The railways have an important role to play in the future of this emerging democracy.

THE END

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[12] Ramzy, (2015, December 9), *op. cit.*

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[1] The title on the title page of this book is "A Soldier with Railways", whereas on the dust-jacket and spine of the book it is "Soldier with Railways".

[2] There are various editions of this publication, and the dates of publication are unclear. It may have been published as early as 1900, and one edition in my possession has a hand-written date "1916" on its cover. This photograph is from an edition with "5000/W.T. 114/8/22" typed at the bottom of the cover page. This may indicate it was published in 1922.

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Appendix A

GLOSSARY OF TERMS

- **ADB**: *Asian Development Bank*.
- **AFPTC**: *Agricultural and Farm Produce Corporation*. Renamed the Myanmar Agricultural Products Agency in 1989.
- **ARSA**: *Arakan Rohingya Salvation Army*.
- **ASEAN**: *Association of Southeast Asian Nations.*
- **CMC**: *China National Machinery Import and Export Corporation.* A Chinese international engineering contractor.
- **CSO**: *Central Statistical Organization,* a part of the Ministry of Planning and Finance. The CSO publishes the annual Statistical Yearbook and the monthly publication, *Selected Monthly Economic Indicators*.
- **DEMU**: *Diesel Electric Multiple Unit.* This is a Diesel Multiple Unit (DMU), but one that is further classified by its transmission type (i.e. diesel-electric). The diesel engine drives an electrical generator or alternator to generate electricity.
- **DMU**: *Diesel-powered Multiple Unit*. This is a multiple-unit train powered by on-board diesel engines. It does not require a separate locomotive. A DMU can also be referred to as a railcar.
- **DRC**: *Diesel Rail Car*.
- **ESCAP**: *Economic and Social Commission for Asia and the Pacific,* also known as UNESCAP.
- **GTZ**: *Gesellschaft für Technische Zusammenarbeit*, or the German Technical Cooperation Agency.
- **IFC:** *Irrawaddy Flotilla Company.*
- **IWT**: *Inland Water Transport*. This is the state-owned transport enterprise operating vessels on the navigable inland waterways in Burma. IWT operates mainly on the Irrawaddy and Chindwin Rivers and in the Irrawaddy Delta.
- **JICA**: *Japan International Cooperation Agency*.
- **KIA**: *Kachin Independence Army.*
- **LID:** *Light Infantry Division*.

- **LRBE**: *Local Rail Bus Engine*. An LRBE is a very small vehicle with a bus or truck engine in the interior of the coach, just in front of the passengers. Often there is a trailer vehicle of similar design but without a truck or bus engine. The LRBE's were built from lorry parts in the railway workshops in Burma, and are powered through rubber-tyred truck wheels. They were built for use on lightly-built branch lines, and many of the small carriages they haul were converted from goods wagons. The LRBE's are old and out-dated, usually overcrowded and uncomfortable to travel in, both because of poor suspension and because of fumes from the engine inside the coach.
- **MNDAA**: *Myanmar National Democratic Alliance Army* is a rebel group fighting Burma's armed forces in Shan State. The MNDAA is a part of the Northern alliance, a multi-faction rebel group.[1]
- **MR**: *Myanma Railways*.
- **NLD**: The *National League for Democracy*, a political party headed by Aung San Suu Kyi, which was swept to power in national elections held in November 2015.
- **OSJD**: *The Organization for Co-operation between Railways.*
- **PCL:** *Public Co., Limited.*
- **RBE**: *Rail Bus Engine*. A Rail Bus Engine, commonly known as an RBE, is in widespread use in Burma, both on the Circular Railway and in regional areas. They are heavy-rail vehicles and are self-contained, with their own power unit. They often operate in regional areas as a two-car train. The driver is in a small compartment at the front, and seating in the main body of the RBE runs parallel to the direction of travel. Passengers on these trains are not allocated separate seat numbers when they buy their ticket. RBE's are not suitable for all lines, notably ones with large gradients (i.e. in hilly regions).
- **RFA**: *Radio Free Asia*.
- **SLORC**: *The State Law and Order Restoration Council*. The military government of Burma (the State Peace and Development Council) was known by this name from 1988 to 1997.
- **SNLD**: The *Shan Nationalities League for Democracy* is a political party. In the 2015 election, it won 3 of 224 seats in the House of Nationalities (Amoytha Hluttaw) and 12 of 440 seats in the House of Representatives (Pyithu Hluttaw). The SNLD holds 25 seats in the Shan State Hluttaw.
- **TAR**: *Trans-Asian Railway.*

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[1] *BBC News*, (2017, March 7), *op. cit*.

- **UNESCAP**: *United Nations Economic and Social Commission for Asia and the Pacific*.
- **USDP**: The *Union Solidarity and Development Party* is a political party associated with the military. It is a successor to the USDA (United Solidarity and Development Association). In the 2015 election, the USDP won 11 of 224 seats in the House of Nationalities (Amoytha Hluttaw) and 29 of 440 seats in the House of Representatives (Pyithu Hluttaw).
- **UWSA**: *United Wa State Army*.

Appendix B

TRACK GAUGES

The gauge of a railway track, known as the track gauge, is the spacing between the inner faces of the load-bearing rails.[1] In this thesis, four gauges are regularly mentioned:

- Metre gauge.
- Standard gauge.
- Broad gauge.
- Narrow gauge.

There is a trade-off of different pros and cons between gauges. Narrower gauges (such as metre gauge and narrow gauge) are cheaper to build but trains travel at lower speeds, have less stability and less load-carrying capacity. By contrast, broad-gauge lines are more expensive to build but enable trains to travel at higher speeds with greater stability. A brief comment on each is given below.

Metre gauge

This is the gauge of the track in Burma, as well as in neighbouring Thailand and Malaysia. As the name implies the track is 1,000 *mm* wide.

Standard gauge

This is probably the most popular one around the world and is 1,435 *mm* wide, or 4 *ft* 8½ *in*.[2] This gauge is also known as Stephenson standard gauge. Standard gauge is the gauge China that will use if ever a line is built from Yunnan Province into Burma (to either Mandalay or to the Arakan Coast).

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[1] *Wikipedia* website, "Track gauge". Retrieved from: https://en.wikipedia.org/wiki/Track_gauge.

[2] *Wikipedia* website, "Standard-gauge railway". Retrieved from: https://en.wikipedia.org/wiki/Standard-gauge_railway.

Broad gauge

There are various broad gauges, and the term "broad gauge" is used to describe a gauge broader than standard gauge.[3] The one discussed in this thesis is Indian broad gauge and is simply referred to as "broad gauge" on the sub-continent. It is 1,676 *mm* wide or 5 *ft* 6 *in* wide. The Indian rail network is the largest rail network in the world. There are various broad gauges. For example the state of Victoria in Australia uses Irish broad gauge which is 1,600 *mm* or 5 *ft* 3 *in* wide, a mere three inches narrower than the Indian/Scottish broad gauge.[4]

Narrow gauge

The term "narrow gauge" is used to describe track gauges narrower than standard gauge.[5] The narrow gauge mostly referred to in this thesis is 1,067 *mm* or 3 *ft* 6 *in* wide. It is the gauge used at the Baldwin Mines at Namtu. Most narrow-gauge railways are between 600mm (1 *ft* 11⅝ *in*) and 1,067mm (3 *ft* 6 *in*) wide. For example, the Arakan Light Railway discussed in Chapter 8 of this thesis was 2 *ft* 6 *in* wide.

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[3] *Wikipedia* website, "Broad-gauge railway". Retrieved from: https://en.wikipedia.org/wiki/Broad-gauge_railway.

[4] *Wikipedia* website, "Rail gauge in Australia". Retrieved from: https://en.wikipedia.org/wiki/Rail_gauge_in_Australia.

[5] *Wikipedia* website, "Narrow-gauge railway". Retrieved from: https://en.wikipedia.org/wiki/Narrow-gauge_railway.

Appendix C

CONFERENCE PRESENTATIONS AND PUBLICATIONS

Presentations have been given at the following two international conferences:

- Stubbs, Lindsay, (2014, August), "*The Railways of Burma – Their Past and Future*". A presentation at the International Burma Studies Conference held in Singapore from 1st to 3rd August 2014.

- Stubbs, Lindsay, (2016, October), "*Railways in Shan State*". A presentation at the International Burma Studies Conference held at Northern Illinois University, DeKalb, Illinois, USA, from 7th to 9th October 2016.

The following journal article has been published:

- Stubbs, Lindsay C., (2017), "Railways in Shan State", Journal of Burma Studies, Volume 20, No. 2, pp.299-364.

Appendix D

STATIONS ON THE TAUNGGYI TO MONG NAI LINE IN SOUTHERN SHAN STATE

Stations on the Taunggyi to Mong Nai line are shown in Table 64 below.[1]

Station	Distance from Yangon (Miles)	Distance from Taunggyi (Miles)	
Taunggyi	424.50	-	
Hpa Mun			
Hang Si			
Naung Kar			
Kek Ku (Kakku)			
Naung Ae			
Banyin	459.75	35.25	
Loi Hsan Sit			
Hsaik Hkaung	501.35	41.60	This is as far as the train goes now.
Loi Pu			
Kaung Ke			
Pyin Tha Ya			
Mi Ye			
Htiyi			The train was going to here in early 2016.
Pwin Chaung			
Pu Ya sin			
Thi Pin			
Nam Hu			
Kaung Maing			
Naung Mo			
Hwe Hse			
Maing Sit			
Haning Na Nge La			
Ma Lan Hkam			
Ah Hma 5 Ywa			
Namsang	645.95	144.60	
Ah Hma 6 Ywa			
Na Kyu			
Haik Hpa			
Wan Ye			
Pang Au			
Na Khan			
Mong Nai	822.45	176.50	

Table 64: Stations on the Taunggyi to Mong Nai line.

[1] *Wikipedia* website, "List of railway stations in Myanmar", *op. cit.*

Appendix E

RAILWAY TIMETABLE FROM MINBU TO PWINTBYU

At Minbu Railway Station on the Pakokku to Kyangin line, a small timetable in Burmese is displayed on the wall. Table 65 below gives a translation of this timetable.[1]

Station	Arrival / Departure Time	Arrival / Departure Time
Pwintbyu	0700	1710
Le Gaing	0720 / 0721	1648 / 1649
Hta Naung Taw	0738 / 0739	1630 / 1631
Saku	0751 / 0752	1617 / 1618
Minbu	0810	1600

Table 65: The timetable for the rail service between Minbu and Pwintbyu.

The morning train departs from Minbu at 7:00am, arriving at Pwintbyu at 8:10am. The train returns to Minbu in the afternoon, departing Pwintbyu at 4:00pm and arriving at Minbu at 5:10pm. I have not travelled on this section of the line yet.

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[1] I recorded this timetable when I was at Minbu Station on 15th January 2013. I am most grateful to Mr Win Pe for translating this timetable from Burmese to English.