

9. A FUTURE FOR RAILWAYS IN PNG?

New Economic Directions

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apua New Guinea's economic and financial crisis of the 1990's places the nation at a watershed of economic development. Conventional development models which sought to transform the economy from a subsistence-agrarian base to an industrial society have clearly failed and PNG has found its infant industries increasingly uncompetitive in a global economy. The majority of Papua New Guineans have resorted to *rent collection* from resource projects, such as mining, petroleum and forest logging, and their demands have made the investment climate increasingly unstable.

PNG's lack of competitiveness is linked to the high transaction costs of an economy lacking performance-based institutions and secure property rights. For instance, in 1992 PNG's prevailing hourly wages were 300-480 per cent higher than those in competing countries (Indonesia, Philippines and Fiji), the cost of utilities and services were much higher than in competing countries and there had been virtually no increase in productivity in the formal economy per person employed from the early 1970s to the late 1980s^{1/}.

An economic recovery program was implemented in 1995 with assistance from the World Bank and the International Monetary Fund (IMF). However, there has been strong political opposition to the reforms based on the strong cultural attachment to land in PNG. Land tenure reforms aimed at mobilising land resources for development projects have been set aside and populist causes for the expenditure of public funds have held sway over the economic rationalism of the World Bank and IMF which is rejected as an externally imposed conspiracy.

At the same time, PNG is seeking a place in the emerging global trading and information economy. The dramatic changes of the 1990's have been characterised as a transition to post-industrial economies. Features include:

- a shift of resources from materials and energy to information and knowledge;
- restructuring of employment from manufacturing to service industries, particularly information- and knowledge-based activities ;
- expansion of large firms from local and regional bases to global activities to take advantage of international networks;
- a shift in employment from large firms to small firms as functions are "outsourced" to specialist providers;
- a dramatic expansion of electronic, multimedia forms of communications ;
- rapid increase in information technology capability; and
- confluence of information and communications technologies which are evolving into global information *superhighways* providing access to vast stores of information.

Another trend in Western societies has been rising public concern over environmental degradation and pollution, particularly in urban areas. This is generating fundamental

^{1/} SRI International, *Papua New Guinea Industrial Growth Strategy*, Report prepared for ADB TA No. 1580 PNG, August 1992, p. 70.

changes in industrial and transport technology. Rail-based transport technologies with low emissions and land use requirements are increasingly seen as an essential element of sustainable development. Computer management systems are also pre-adapted to rail transport and are playing an increased role in enhancing their environmental efficiency.

These global changes impinge on PNG and shape the future directions of the economy. Nevertheless, instability and low competitiveness hinder prospects for industrialisation which might generate employment for the rapidly growing urban populations. PNG's future manufacturing activities will mainly be confined to domestic food processing for urban markets and service industries in the transport sector. Further investment in large-scale resource projects depends on fiscal and social stability to reestablish a favourable investment climate.

Future Transport Directions

The analysis presented in the previous chapters indicates that past failures to establish and sustain substantial railways in PNG has resulted in an inadequate industrial and institutional base for a modern transport system. Moreover, Nationals only play a minor role in the management and ownership of commercial enterprises, including transport. This has generated high levels of dissatisfaction with the current conditions.

Isolation of communities from markets and the high cost of transport continue to be key themes in Papua New Guinea politics. In 1995 the Government declared that road transport is the cheapest and most convenient means of transporting people, goods and services^{2/}. Nevertheless, the cost of building and maintaining roads under PNG conditions is very high. In response to this situation, several proposals have been put forward for the introduction of railways to help build the institutional capacity and transport efficiency necessary to compete in the modern world. These concepts are described in the following sections. They fall into two distinct approaches: those which seek to build local management and industrial capacity from the ground-up; and technological approaches which seek to transfer modern overseas railway practice to PNG without consideration of local culture or institutional factors.

The Bougainville Initiative

The closure of the Panguna copper mine on Bougainville island following the outbreak of armed rebellion is discussed in chapter 7. In the resulting anarchy and civil conflict, much of the island's infrastructure was destroyed. The process of pacification and reconstruction commenced in 1993.

As services were gradually restored and the Government set about the task of restoration, the people of Bougainville reviewed the experience of their conflict and pondered their future development options. Many saw the former economic structures, including the foreign mining enclave and the dominance of road transport with its reliance on private vehicle ownership, as contributing factors in their misfortune.

Destruction of transport facilities during the Bougainville Crisis has generated a need for reconstruction of infrastructure. However, some Bougainvillians felt that the high running and social costs of road transport also needed to be addressed. They argued that a transport system based on private vehicle ownership provides special privileges to the

^{2/} Baing, A, "Policy speech to National Parliament on Transport", reported in *The National*, 29 March 1995.

wealthy and leads to abuses of the freedom of movement of others. Their vision of the future gave higher priority to public transport solutions in which they could play a more meaningful role.

Michael Pearson assisted this group develop a proposal for the reconstruction of Bougainville on a self-help basis using light railways as an alternative to road transport. The proposal highlights the potential role of rail transport in providing safe, reliable and cost-efficient transport which will unite and build the society with a renewed sense of self-reliance and interdependence^{3/}. Publicly-owned 610 mm gauge light railways are proposed, with second-hand locomotives from Australian sugar railways and locally-fabricated rolling stock. On lightly-trafficked branch lines, portable track with the use of animal power is envisaged.

The main objective is to provide cheap, safe, reliable, all weather transport to the producers and rural communities of North Solomons Province. A subsidiary objective is to provide jobs for unemployed youth. The scheme would also provide an opportunity for landowners and subsistence producers to be involved in and invest in the development of a transport system which would reduce transport cost, increase productive returns and eventually reduce the dependence on imported fuels. The system would use a high proportion of local materials - timber for sleepers, rolling stock construction and bridges - and develop managerial and industrial skills through construction and operation tasks.

Based on pre-crisis cash crop production, the freight task for the railway is estimated at 54,000 tonnes/annum, while it would also need to meet the local transport requirements of 150,000 people. A full railway network servicing Bougainville and Buka Islands is estimated to require 500 km of light railway, 14 to 21 locomotives, 200 to 300 rail trucks, 20 passenger trucks and four railcars. The estimated capital cost (1992 prices) for a 610 mm gauge permanent system is K25,000/km and for portable track K18,000/km. This compares with K9000/km for graded roads and K60,000/km for 43 mm tar sealed roads. However, annual maintenance costs for graded roads are estimated at K7,200/km compared with K2,100 for the permanent railway and K1,600 for the portable track. More significantly, the light railway would generate many more jobs in the local economy than road construction and maintenance. Estimated freight costs for rail are 22-24 toea/tonne/km compared with 82 toea for graded roads. Comparative passenger costs are K2.20 and K8.20 per 100 km.

The proposal is based on principles which differ markedly from the *modernistic*, free-spending, global and individualistic values which currently characterise the PNG economy. Successful models for such a venture are difficult to find. However, the recent example of Eritrea where the government is rehabilitating its war-damaged railway using local resources, including the labour of demobilised soldiers, rather than relying on external finance and technology has recently captured international attention^{4/}. The self-reliance philosophy has resulted in the overhaul of old steam and diesel locomotives and the rebuilding of rolling stock using whatever resources are locally available. Unfortunately, there is little evidence that such an austere approach might be enthusiastically taken up in PNG and on Bougainville continued terrorist attacks have hindered the task of reconstruction.

^{3/} Pearson, MR, "Use of Railways in PNG", Submission to Minister for Transport, May 1992.

^{4/} *Continental Railway Journal*, No. 105, Spring 1996, p. 342; *SBS World News* 16 March 1996.

Railways and Environmental Protection

The desire of resource owners in Papua New Guinea to gain wealth through the rapid exploitation of forest, marine and mineral resources has led to excessive environmental damage. In the forest sector, in particular, this environmental degradation has received considerable international attention.

Of major concern is the environmental damage caused by logging roads and soil compaction by heavy logging machinery. Forest roads require a 40 metre clearing for the road alignment and tracked vehicle access. They are a major source of erosion and sediment discharge into water courses. In contrast to the damage caused by modern logging methods, logging railways operated in PNG for lengthy periods (Chapter 2). Rail-based transport minimised the land area required for transport infrastructure and encouraged long-term management practices. The reintroduction of logging railways as a means toward more sustainable forest harvesting practices is one option for a more sustainable forest industry.

Although, forest railways are normally considered as a high-volume transport mode for large central mills, past operations in PNG demonstrate that low-cost lines built by entrepreneurial operators can play an important role in transporting logs and timber. Such railways utilise a much higher proportion of local input than road transport - timber rails, home-made trucks and rail-tractors for instance - and are less intrusive on the forest. Environmentally, they minimise the area of land taken over for transport infrastructure, while the opportunity to spread loads over a wide area through the track and sleepers enables railways to transport logs over areas (eg, swamps) where roading is impractical. The use of self-balancing inclines enables railways to operate in steep topography at relatively low cost.

Other advantages of logging railways are the continuous and assured flow of logs to the mill with minimal disruption during unfavourable climatic conditions, reduced wastage of timber in the forest and minimal losses during transport. Initial overhead costs may be high, but operating costs are low where there is sufficient throughput to justify the investment.

A major barrier to logging railways in the PNG context comes from the expectation of forest resource-owners that logging will result in construction of road infrastructure, thereby improving their access to services and markets. Until resource-owners come to see railway infrastructure as a superior option from a social point of view, this option is likely to receive limited support.

In the mining and energy sector, the success of the North Paibuna railway in providing safe transport across sago swamps is expected to lead to similar applications elsewhere. For the Nena mine on the border between East and West Sepik, the environmental impact study has identified social and environmental difficulties with the use of the May River as a transport access to the site. The alternative is a 30 km transport corridor from Nena to the Sepik River. This route requires the bridging of a considerable area of sago and nipa swamp. A light railway line with adequate capacity to transport containers to the mine site is an environmentally-sensitive option for the project.

Lae-Highlands Electric Railway

An engineer at the University of Technology, Dr Kris Korzeniowski, has drawn on international rail developments to propose a modern electric railway from Lae to Porgera in the Highlands. The proposal is based on the utilisation of the renewable energy

resources of PNG's hydro-power system to stimulate development in the areas served by the line^{5/}. Detailed costing of the 800 km line is said to be proceeding.

The Highlands electric railway proposal is based on modern world engineering practice, particularly recent trends in electric traction in Europe. It assumes that management expertise and the institutional base necessary for successful operation would be imported along with the technology. Although such *modern* technology appeals to the fascination of politicians, economic and social realism is not a strong feature of the proposal. Securing the land corridor and the future infrastructure with adequate security to attract the necessary investment capital appears problematic given the current civil unrest along the proposed route. The necessary economic base to justify the investment remains a pipe dream.

Another grand vision for a railway between Lae and Port Moresby was put forward by Lae MP Hon. Bart Philemon in October 1995^{6/}. The proposal was prompted by an announcement of increased air fares. It followed a visit by Mr Philemon to mountain railways in Germany and was backed by a submission for a German company to undertake a pre-feasibility study of the route. Again, the economic, institutional and social elements of the project were overlooked.

Urban Railways

The issues of rapid urbanisation in PNG have been addressed in chapters 6 and 7. With a population over 250,000 and rapidly increasing, Port Moresby is experiencing significant traffic problems. In Europe, a number of similar sized cities have recently established light rail rapid transit public transport systems^{7/}. They include Saarbrücken (pop. 180,000), Caen (198,000), Strasbourg (250,000), Lausanne, (285,000) and Rouen (392,000). In these cases, public concern over the environment and quality of life issues has resulted in the will to invest in an attractive alternative to the private car for urban commuting which reduced congestion, local noise and atmospheric pollution, while improving safety. However, evaluation of modern light rail operations highlight the following lessons for success^{8/}:

- political will for long term investment in public transport, backed by strong community support to overcome environmental problems;
- an adequate local financial base (either from tax or private investment) to fund the infrastructure and support ongoing operations;
- adequate capacity of users to pay an economic fare;
- the vital role of institutional or management capacity to ensure that customers are provided with a superior service at reasonable cost;
- secure, long-term land security over rights-of-way for segregated public transport corridors;
- a stable investment climate which encouraged investment in long-term projects; and

^{5/} Peni, E, "Trains: an answer to PNG's transport needs", *PNG Business*, August 1994, p. 17-18.

^{6/} *The National*, 20 October 1995.

^{7/} Wyse, WJ, "Transport and the environment", *Light Rail and Modern Tramway*, February 1995, p. 29.

^{8/} For example, see Buisson, C, "How France has overcome the investment nightmare", *Light Rail and Modern Tramway*, December 1995, p. 408

- public pride in the light rail system which ensures security and care for the infrastructure and rolling stock.

None of these requirements currently exist in Papua New Guinea. While the majority of people in Port Moresby, are dependent on public transport, they have benefited from a system of mini-buses which provide cheap transport, subsidised by rural communities rather than the state. They generate a large source of employment for drivers and offsidars. However, the mini-buses are inefficient movers of large numbers of people, they contribute to road congestion and they rely on imported fuel. Poor maintenance standards result in high levels of exhaust emissions by the mini-buses and other transport. This atmospheric pollution is already a significant contributor to Port Moresby's deteriorating air quality.

With increasing traffic congestion in Port Moresby and the concentration of commuter flows along well defined corridors, the potential for light rail to meet urban commuter needs has been regularly raised in the media. Nevertheless, priority in urban transport planning continues to be given to private cars. A K60 million project to construct the Poreporena Freeway to connect the town area with the airport commenced in June 1995. Media attention has focused on this glamour project which is directed at improving the traffic flow for the small proportion of Port Moresby's population who can afford private cars.

Proposals for a commuter rail system in Port Moresby have recently emerged. In July 1995, the Prime Minister, Sir Julius Chan, publicly urged the National Capital District Commission to commence planning a railway system to connect Port Moresby town to Boroko, Gerehu, 17-Mile on the Sogeri Road and the Tatana/Buruni areas⁹. In March 1996, the Prime Minister again raised the idea in terms of a railway to adjoin a stretch of the new Poreporena Freeway¹⁰. However, the Governor for the National Capital District expressed reservations about the railway project.

These proposals do not appear to be based on an in-depth assessment of the economic and social factors necessary for successful operation in the Papua New Guinea context. The prospects for an urban-based rail revival are therefore not optimistic.

Conclusions

Many observers claim Papua New Guinea has reached a watershed in its economic and social development. Must the future development of railways await social change and public demand for their construction, or will new railways be built to themselves change the nation's social institutions and development pattern?

Elsewhere, particularly in Europe and Japan, the building of railways dramatically changed the society. In PNG, successive administrations have taken the easy way out

⁹ / *Post Courier*, 14 July 1995.

¹⁰ / *The National*, 15 March 1996.

and sought *modern* infrastructure without tackling the hard issues such as land rights and respect for public and private property.

If the necessary social and institutional change for PNG to compete in the emerging global economy is to occur, then Papua New Guineans may need to go back to the fundamentals. Turning to low-cost, self-help railways, such as those proposed above for Bougainville, can contribute to this fundamental change. As with Eritrea, the conflict which has torn Bougainville society apart may yet provide the basis for a fresh start and low-cost, community-orientated railways could provide the building blocks for a unified and productive society.