PR of China: Rail Transport Programme

Ex post evaluation report

OECD sector	21030 / Railway sector	
BMZ project ID	a) 1998 65 791 - Railway electrification Harbin-Dalian b) 2001 65 217 - Rail transport programme II (SVP II) c) 2002 65 694 - Railway Chongqing-Huaihua (SVP III) d) AF 2003 290 - Basic and advanced training (SVP III)	
Project executing agency	Ministry of Railways (MoR)	
Consultant	a) GOPA, Bad Homburg b) ./. + c) ./. d) Obermayer & RailConsult (later: Interfleet)	
Year of ex post evaluation	**2010 (2010 random sample)**	
	Project appraisal (planned)	**Ex post evaluation (actual)**
Start of implementation	a) Ist Quarter/ 1999 b) Q III 2003 c) Q I 2004 d) Q I 2004	a) IIIrd Quarter/ 1999 b) Q IV/ 2003 c) Q I/ 2004 d) Q I/ 2004
Period of implementation	a) 2 years b) 3 years c) 2 ½ years d) 2 ½ years	a) 2 ½ years b) 3 years c) 2 ½ years d) 2 ½ years
Investment costs (in Mio. EUR)	a) 755 b) 63.9 c) 2,004 d) 0.5	a) 763 b) 67 c) 2,000 d) 0.5
Counterpart contribution (in EUR millions)	a) 632.2 b) ./. (c) 1,935 d) ./.	a) 579.7 b) ./. c) 1,928.6 d) ./.
Financing, of which Financial Cooperation/ FC funds (in millions EUR)	a) 122.8 (composite loan)/ 61.4 (FC) b) 63.9 (composite)/ 25.6 (FC) c) 69.0 (composite)/ 27.6 (FC) d) 0.5 (FC)	a) 183.3 (composite)/ 91.7 (FC) b) 66.8 (composite)/ 26.7 (FC) c) 71.4 (composite)/ 28.6 (FC) d) 0.5 (FC)
Other institutions involved		
Performance rating	1 (a, c, d) / 2 (b)	
• Relevance	2	
• Effectiveness	1 (a, c, d) / 2 (b)	
• Efficiency	1 (a, c, d) / 2 (b)	
• Overarching impact	1 (a, c, d) / 2 (b)	
• Sustainability	1	

Brief description, overall objective and project objectives with indicators

The overall objective of all projects is to contribute to optimising the transport system in an economically efficient and environmentally sound manner by virtue of rail transport.

For modernising the 946 km railway connection between Harbin and Dalian, the German contribution supported the line's comprehensive electrification, whose capacity should be increased and utilised accordingly (project objective). Of the total cost of EUR 763 million, German financing amounted to about 28%, EUR 91.7 million of which was an FC loan.

The Rail transport programme II (SVP II) encompassed the delivery of modern construction equipment, machinery and related components for the expansion of railway transport routes, with the objective to support the effective and efficient implementation of thse construction activities. Overall costs of EUR 67 million were financed through German funds, whereby the FC share totalled EUR 26.7 million.

The Chongqing-Huaihua Railway (SVP III) project comprised the construction of a new 625 km line between Chongqing (western China) and Huaihua (central China), with components for track energy, signalling technology and ancillary equipment financed from the German contribution. The project purpose is to improve the connection of remote areas in western China – with hitherto underdeveloped infrastructure – to the coastal regions. Total costs amounted to about EUR 2 billion. The share of German financing was 3.6% with FC funds totalling EUR 29.1 million (including a EUR 0.5 million grant for training and advanced training/ A+F).

Project Design/Major Deviations from Original Planning and Main Causes

The project was implemented as planned, major deviations occurred only on the Harbin-Dalian line: Due to foreign exchange cost savings, a 94 km long single-track connection line (Gou-Hai line) was supplementally electrified, using residual funds. That line branches to the west from the main Harbin-Dalian line near the city Haicheng (approx. 200 km north of Dalian) to Goubangzhi; there, it connects to the existing main line of Shenyang to Qinghuangdao. This reduces the distance between Qinghuangdao and Dalian by approx. 100 km, bypassing the junction station of Shenyang and closing the gap between the two adjoining, electrically operated lines.

The outcomes included

- the achievement of a traffic density of 126 million transport units (TU) per line km on the Harbin-Dalian route (comparing with an average about 8 million TU km /line km on the electrified network of the German National Railways in 2005), through which the target indicators defined in the PA were achieved or exceeded in 2009;
- the significant performance improvement of the rail-based construction industry through equipment (e.g. tunnel drilling machines) in the framework of the SVP II;
- the creation of a reliable and secure as well as environmentally-friendly and energy-efficient transport capacity for people and goods on the Chongqing-Huaihua line in a structurally weak and mountainous area, which thus far was insufficiently accessible by roads and without railway access.

Key results of the impact analysis and performance rating

The internal rates of return (4.5% p.a for the Harbin-Dalian project and 4.7% for the Chongqing-Huaihua railway/ SVP III) constitute – in global comparison – unusually high

values for railway investments; they are owed to the internationally unique utilisation rate of those lines – more than ten times above the German electrified network's rates.

The economic rate of return is 11% for the Harbin-Dalian project and 9% for the Chongqing-Huaihua line. In both cases, only the saved costs of avoided road transportation are included, but no further benefits such as passenger time savings. Considering this, the values are significantly above global average.

An important secondary objective of all three projects were environmental benefits of resources. By strengthening the competitiveness of railways compared to roads, the FC project contributed to saving energy, reducing pollution and CO_2 emissions. The CO_2 reductions are calculated at 6 million tonnes for the Harbin-Dalian line and 14 million tonnes for the Chongqing-Huaihua line over a 20 years' period. Potential negative side effects of the Chongqing-Huaihua and Harbin-Dalian lines on the environment through noise, resettlement, land use, etc. were assessed prior to project implementation and were assessed as low and/or requiring no action. Due to the advantages of modern technologies (e.g. low noise pollution and land requirements), the impacts of the FC financed equipment components and machine delivery on the environment were rated as low. Concerning railway construction and electrification, careful design required no further mitigating action to contain environmental damages.

The Chongqing-Huaihua project resulted in both of the poor West provinces being better connected to the coastal region. Thus, poor areas along the route particularly benefited from the project.

No specific risks emerged or were identified for the three projects. However, for the new or expanded lines there was a risk that competing road transport would gain some comparative advantage. This actually occurred, but did not impair the project as both lines are being utilised at full capacity at present or in the near future. The strong economic growth in China ensures a continuously high utilisation rate of the project lines (as well as of the overall network), even if the market share of the railway is declining due to current high dynamics: Inherently, investment response to such a sharp demand rise cannot take place as quickly and flexibly in the railways sector as in the road sector. With adequate technical, organisational or financial maintenance capacities, there is no evidence of the classic risk of a premature performance decline.

All projects addressed an important development obstacle. The projects are in line with the German Cooperation's aim to contribute (albeit moderately, with view to the overall context and investment volume) to optimising the transport system in an economic efficient and environmentally friendly manner; they equally conform with the Chinese Government's priorities. Furthermore, the imported supplies and services financed with German funds make an important contribution to technology transfer. Accordingly, the relevance of the project has been assessed as good (rating: 2).

The objectives for both project lines were over-achieved. The equipment support (SVP II) contributed to shortening construction periods by modernising existing equipment and machinery; In terms of proportion, however, this effect is small, whereas the key aspect was the resulting technology transfer that took place. The effectiveness was assessed as very good (rating 1) for the two line projects and as good (rating 2) for the equipment assistance as a result of the technology transfer.

The specific investment costs per km for both railway line projects are below international reference values for comparable topographical situations. The specific costs for the German contribution are relatively high for Chinese standards, but will be offset in the medium term through higher reliability and lower repair and maintenance ex-

penses. Both project lines are being fully utilised. Therefore, the efficiency of both line projects is rated as very good (rating 1). The investment in construction machinery is very well utilised, with the equipment being used without long down times. The higher costs compared to Chinese manufactured machines are at least partially offset by the technological advantage of the project-financed machines that enable more efficient construction. We assess the equipment assistance with a rating of good (2).

As part of the overall objective, all three projects contributed to the socio-economic development of the country and the project regions. Primarily in the southwest provinces along the Chongqing-Huaihua line, poorer population groups were able to benefit from increased transport links. Besides, positive impacts from technology transfer deserve mentioning: this applies both to the railway line projects (electrification of the Harbin-Dalian line and for the Chongqing-Huaihua line) as well as the construction equipment support, of which some machinery can meanwhile be manufactured in China. For all three projects, another impact is the reduction in CO_2 emissions, which in the case of Harbin-Dalian was estimated at about 0.6 million tonnes CO_2. The overarching developmental impacts resulting from the German contribution were moderated by the low German financing share of the total costs. Nevertheless, they are rated as good (rating 2).

The operation and maintenance of the railways and the projects are financially and organisationally ensured, particularly as the revenues are also able to cover a part of the investment costs. Subsidies are allocated for construction, modernisation and expansion investments from the national budget in accordance with the respective 5 year plans. It is expected that these will also be disbursed in the future. The local operators have command over the technology. Project ownership is evident. There are no perceivable risks to the sustainable operation. We rate the project's sustainability as very good (rating 1).

In total, the developmental efficacy of the line projects (BMZ-Nr. 1998 65 791 and 2002 65 694) is rated as very good (rating 1) and the equipment support (2001 65 217) as good (rating 2).

Notes on the methods used to evaluate project success (project rating)

Projects are evaluated on a six-point scale, the criteria being relevance, effectiveness, overarching developmental impact and efficiency. The ratings are also used to arrive at a final assessment of a project's overall developmental efficacy. The scale is as follows:

1	Very good result that clearly exceeds expectations
2	Good result, fully in line with expectations and without any significant shortcomings
3	Satisfactory result – project falls short of expectations but the positive results dominate
4	Unsatisfactory result – significantly below expectations, with negative results dominating despite discernible positive results
5	Clearly inadequate result – despite some positive partial results, the negative results clearly dominate
6	The project has no impact or the situation has actually deteriorated

A rating of 1 to 3 is a positive assessment and indicates a successful project while a rating of 4 to 6 is a negative assessment and indicates an unsuccessful project.

Sustainability is evaluated according to the following four-point scale:

Sustainability level 1 (very good sustainability) The developmental efficacy of the project (positive to date) is very likely to continue undiminished or even increase.

Sustainability level 2 (good sustainability): The developmental efficacy of the project (positive to date) is very likely to decline only minimally but remain positive overall. (This is what can normally be expected.)

Sustainability level 3 (satisfactory sustainability): The developmental efficacy of the project (positive to date) is very likely to decline significantly but remain positive overall. This rating is also assigned if the sustainability of a project is considered inadequate up to the time of the ex post evaluation but is very likely to evolve positively so that the project will ultimately achieve positive developmental efficacy.

Sustainability level 4 (inadequate sustainability): The developmental efficacy of the project is inadequate up to the time of the ex post evaluation and an improvement is very unlikely. This rating is also assigned if the sustainability that has been positively evaluated to date is very likely to deteriorate severely and no longer meet the level 3 criteria.

The overall rating on the six-point scale is compiled from a weighting of all five individual criteria as appropriate to the project in question. A rating of 1 to 3 indicates a "successful" project while a rating of 4 to 6 indicates an "unsuccessful" project. It should be noted that a project can generally only be considered developmentally "successful" if the achievement of the project objective ("effectiveness"), the impact on the overall objective ("overarching developmental impact") and the sustainability are considered at least "satisfactory" (rating 3).