Laos: Rural Telecommunication III, IV, V

Ex-post evaluation report

OECD sector	22020 / Telecommunications	
BMZ project IDs	199665589, 199865601, 200065235	
Project-executing agency	Lao Telecommunications Company (LTC)	
Consultant	Deutsche Telepost Consulting GmbH (DETECON)	
Year of ex-post evaluation	**2006**	
	Project appraisal (planned)	**Ex-post evaluation (actual)**
Start of implementation of phase III	Q4, 1996	Q2, 1998
Start of implementation of phase III	22 months	40 months
Start of implementation of phase IV	Q2, 1999	Q2, 2000
Start of implementation of phase IV	29 months	34 months
Start of implementation of phase V	Q3, 2001	Q2, 2002
Period of implementation of phase V	33 months	38 months
Phases III, IV, V		
	Project appraisal (planned)	**Ex-post evaluation (actual)**
Investment costs	EUR 14.83 million	EUR 14.97 million
Counterpart contribution	EUR 0.03 million	EUR 0.17 million
Financing, of which Financial Cooperation (FC) funds	EUR 14.80 million	EUR 14.80 million
Other institutions/donors involved	-	-
Performance rating	2	
• Significance/relevance	2	
• Effectiveness	2	
• Efficiency	2	

Brief description, overall objective and project objectives with indicators

The projects comprised the supply and installation of 2.956 ready-to-operate line units of RURTEL technology (Rural Telecommunication systems), central processing units and repeaters as well as consulting services in a total of 99 villages all over the country. The above-mentioned 2.956 line units included 1.060 ports created within exchanges in three bigger villages (in phase V). Instead of using the RURTEL technology, the respective subscribers were connected directly to exchanges or to the telecommunication network via modern radio technology. The latter measures made use, to a high degree, of the created RURTEL

Infrastructure, but were financed from (minor) counterpart funds provided by the project-executing agency. Thus, these 1,060 line units are an integral part of the projects.

The overall objective of the projects was to make a sustainable contribution to Laos' economic and socio-economic development by improving the provision of basic telephone facilities for business and administrative authorities in the project region. The indicator to measure the achievement of the overall project objective was the overall productive use of the installed line units, expressed by the number of private commercial enterprises, public authorities and the installation of public pay phones. In phase III, productive users (commercial enterprises) and public authorities accounted for 83% of the installed line units and public pay phones for 10%. In phase IV, the figures were 88% and 6%, respectively, and in phase V 83% and 3%. The share of private users in the three phases accounted for 5%, 6% and 14%, respectively. From today's perspective, the overall project objective has been clearly achieved.

The aim of the projects was to ensure the sustainable use of the installed line units. To this end, two indicators were determined: (1) One year after the start of operations, 90% (phases IV and V) or 100% of the line units (phase III) are being connected; (2) average revenue from telephone tariffs per connected subscriber amounts to EUR 399 annually (phase III) and USD 1,000 (phases IV and V). The actual subscriber load amounted to 98% (phase III), 100% (phase IV) and 97% (phase V). Thus, indicator (1) is mainly fulfilled. However, from today's perspective, it has to be stated that this indicator covers only the potential, but not the actual use of the capacities. Indicator (2), on the other hand, has not been fulfilled: the actual revenue per subscriber and year varies between USD 216 (phase III in 2005) and USD 420 (phase III in 2004). The main reasons for the non-fulfilment of indicator (2) are, probably, the following: a) the increasing competition by mobile telephone systems and competitors from the fixed network market also in the RURTEL villages. Currently, rural telecommunication systems are facing this competition in 73 of 95 RURTEL villages. b) the considerable tariff decrease expressed in USD due to the massive devaluation of the currency during the time of hyperinflation; c) the relocation of RURTEL installations to previously undersupplied villages which, due to the severe poverty, generate less revenues from tariffs.

However, from today's perspective, the non-fulfilment of the indicator "revenues from tariffs" is not very meaningful with regard to the achievement of the objective of "sustainable use", since this objective includes two dimensions, quantity and price, of which the quantitative dimension is primarily of interest in terms of user intensity. The price dimension is, of course, also important because sustainable operation depends on the availability of sufficient funds. Nevertheless, the price dimension will be evaluated later when looking at the analysis of the financial situation of the Lao Telecommunications Company (LTC). Today, LTC is an economically efficient project-executing agency which is able to cross-subsidize even economically less well-performing business areas (such as rural areas). Thus, revenues from tariffs are today not as important for the achievement of the project objective as at the time of the project appraisal, when economic efficiency of the project-executing agency was lower. Thus, from today's perspective, we consider indicator (2) no longer as suited to measure the achievement of the project objectives.

Given these considerations regarding the indicators for the achievement of the project objectives (1) and (2), further indicators to measure the intensity of use and the technical quality of the offered telecommunications services were defined. These are the following: (3) the period of use of the installations (length of the phone calls, in minutes); (4) the number of phone calls; (5) the technical availability of the installations, the number of technical failures per connected subscriber per year and the elimination of technical failures within five days. The values of the indicators of achievement of the project objectives (3), (4) and (5) show that the project installations are of high technical quality and are being used intensively. The few technical failures are rapidly being eliminated. From an overall perspective and from today's perspective

we consider the project objective "to ensure sustainable use of the installed line units" to be fulfilled in all the three phases III, IV and V.

Project Design/Major Deviations from Original Project Planning and Main Causes

The project design was drawn up by LTC with the assistance of a consultant. After bids had been reviewed with regard to technical and financial terms, the supply and service contracts were awarded directly to the German company ALCATEL (and later to the German company Thales, which had taken over the system from ALCATEL). The supply and service contracts for the microwave links were awarded to the Malaysian enterprise SEL Telecommunications. The direct award to ALCATEL was due to the system in place: the new installations constituted an expansion of the capacities installed in the preceding phases which, for technical reasons, could only be implemented by the original supplier and, in addition, made for a homogeneity of the systems. The design, planning and implementation of the projects were implemented according to plan and have proven to be successful.

It is to be questioned, however, whether the project design was appropriate to tackle the main problem, since technical progress was very rapid since the project appraisal of phase III in 1996, with the result that today fixed telephone networks and even mobile phone systems are available in many project locations. However, it has to be acknowledged that the decisions regarding the project design taken at the time of the project appraisal are comprehensible. The quick expansion of the mobile phone network and the considerable decrease of mobile phone tariffs were unforeseeable at the time of project appraisal.

Key results of the impact analysis and performance rating

Since the project appraisal of phase III in the year 1996, the telecommunications sector has experienced continuous substantial growth. In 1996, LTC was practically the only provider of telecommunication services. There were approximately 16,000 main lines, mobile phone systems with a modest number of 400 line units were only available in the capital of Vientiane. However, technical standards (digital exchanges) were up-to-date at the time because the whole telecommunication infrastructure had been established in the 1990s. Today, four telecommunication providers are active in Laos. Due to its former monopoly position, LTC is still the market leader. However, in Vientiane and in the bigger villages, more and more competitors are active in the market, both in the fixed telephone and in the mobile phone areas. Although the telephone density (fixed /mobile) has increased from 0.2 lines per 100 inhabitants to 3.2 since the mid 1990s, it continues to be very low (Cambodia: 3.8; Vietnam: 8.8; People's Republic of China: 42.4; numbers from 2003). The telecommunication services are of good quality.

While the network expansion in the cities is financed from the own funds of the network operators or from reinvested profits, the expansion of telecommunication infrastructure in rural areas has so far exclusively been implemented with the support of German Financial Cooperation. Although the absolute number of lines financed from FC funds is relatively low, the FC measures can be qualified as national measures due to the strong regional spread of the measures.

In phases I-V of these projects, approx. 3,600 lines were created in 16 provinces, 69 district capitals and 26 villages.

However, this is far from sufficient to meet telecommunications needs in rural areas. Given a total of 11,000 villages and an assumed number of five lines per village, there is a potential demand of 55,000 lines. Thus, the current measures only achieve a rate of coverage of approximately 5%. A clear signal of the high demand are the rapid connection of the project facilities and the continuing high degree of new lines. The high demand in rural areas is also

impressively illustrated by the fact that in the meantime, RURTEL facilities with an overall capacity of 512 line units that had been created during project phases I-III have been de-installed in 21 villages and newly installed in more remote villages with no telecommunications supply at all. In these 21 villages, LTC has installed bigger facilities and now supplies 14,000 telephone lines (originally planned: 512). The FC measures served as pilot project for rural areas without which most of the villages would not have been connected to the national telecommunication network or only at a much later time.
The target group of the projects included, as planned, mostly productive users and public authorities and, to a smaller degree, also private users in the project region. The access of the general public to the offered telecommunication services has been guaranteed via public pay phones. In addition, LTC has established so-called telecentres since 2003, which give other interested parties access to telecommunication services. In addition, the connections are also used by relatives and friends. Furthermore, against payment, they are left for use to third parties. LTC also sells so-called IntCards. With a corresponding credit balance, each holder of such an IntCard can make foreign calls from any telephone by using a PIN number. This IntCard is very popular. Thus, the number of beneficiaries of the projects is substantially higher than the number of subscribers (however, precise figures of such beneficiaries cannot be given).

The projects are operating without any failures worth mentioning. The concept of the project-executing agency for the operation and maintenance of the facilities is appropriate. Accordingly, from today's perspective, the operational risk is low.

The project-executing agency LTC is a joint-stock company in which the government of Laos holds a majority of 51% and the other 49% are owned by the Thai company Shinawatra. LTC is being operated as a joint venture. Shinawatra is not only invested in the company's capital, but has also permanently assigned experts to the company's operative departments. LTC has contributed substantially to the described expansion of the telecommunication service sector. It is a company with an appropriate organisational division and qualified employees at all levels. During the period under review, labour productivity could be increased considerably. The financial situation of LTC is good. In summary it can be said that in the Laotian context, which is strongly marked by the thinking and action of the former planned economy system, LTC is a very efficient project-executing agency which is able to fulfil its main tasks in a sustainable way (even beyond the implementation phase of the projects).

On the project level, a profitability and a cash flow calculation were made. In all the projects the internal rate of return expected during the project appraisal was clearly not reached; the actual values vary between -5.9% and -10.5%. This is mainly due to the non-achievement of the expected level of revenues from tariffs. In terms of cash flow, too, expectations were largely not fulfilled. In the project phases IV and V, there was a negative cash flow. Only in phase III cash flow was positive because in this phase FC funds were provided as non-refundable grants. However, at least the operating costs are covered from revenues. During project appraisal it was assumed that the project-executing agency would be able to balance negative cash flow in the respective years with surpluses in the profitable business areas (urban networks, mobile phone systems). This assumption can definitely be confirmed from today's perspective. Although during the repayment years of the FC loan (in domestic currency) the projects were a burden on LTC's liquidity, this did at no time pose a threat to LTC's overall liquidity. This is also reflected in the fact that the RURTEL line units installed under project phases III to V accounted for less than 1% of all of LTC's line units.

It is not possible, with reasonable effort and expenses, to establish a macro-economic profitability calculation for projects of this kind. While the macro-economic costs can be calculated, the projects' benefit cannot be quantified precisely. In spite of this, the projects definitely have significantly positive impacts. These are generated primarily by a more efficient

transfer of information which is an important condition for economic activity and lower transaction costs. This could be proven impressively by interviews conducted among the users.Thanks to the use of the telephone, commercial users were able to avoid most of their travelling to suppliers and clients; thus they could save time and costs. The following other impacts can be mentioned:

a) Education: School management can exchange important information with authorities that are further away. Parents stay in contact with their children who are attending far-away secondary schools and cannot return home every day.

b) Health care: medications can be ordered and delivered faster. Rural health facilities can now count on further medical support in case of need.

c) Safety and public order: the police and local authorities are now able to communicate quickly with the outside world.

d) Labour market / regional economic impulses: the rural exodus is a growing problem, also in Laos. Given the existence of telecommunication services, people will now be more willing to work in the project region. Still, it has to be said that the projects have neither created nor saved a great deal of jobs in the region. Surely much more is needed to significantly improve the conditions for investment in the project region.

Projects of this kind do not have the potential to contribute to gender equality. They do not have gender-specific impacts. The projects did not aim at promoting participatory development / good governance. The poor population was not necessarily among the direct beneficiaries of the projects. However, poor people do benefit to a certain extent from the projects because they are given access to telecommunication services through the use of public pay phones and telecentres and they profit from more efficient social and administrative services (education, health, admistration) and from overall economic growth. Overall, the projects contribute to cross-sectoral poverty reduction. There were some minor environmental impacts due to the construction of the relay stations and related access roads, however, the extent of such impacts are acceptable. In conformity with the implementation agreement, the project-executing agency presented a plausible concept for the disposal of the batteries for the solar power systems, which have to be replaced every 8 to 10 years.

We rate the developmental impacts of the projects as follows:

- As already indicated, the project objectives are considered achieved. The projects are being operated properly and the project-executing agency is working efficiently, even in financial terms. The same is assumed for the further technical and economic lifetime of the facilities. During the phases of negative cash flows, LTC could and still can internally cross-subsidize the deficient areas. We thus consider the financial and operational sustainability to be ensured. We judge the projects' effectiveness to be satisfactory (sub-rating 2).

- From today's point of view, too, we consider the identified core problem (difficulties in the collection of information and high transport costs and/or even inaccessibility of rural areas in the rainy season) to be the prime problem. The fulfilment of the project objective contributes, also from today's perspective, to the achievement of the overall objective. The sub-criterion of relevance has been well achieved. The overall objective was achieved. The projects have a broad-scale effect: the measures covered the whole country and the number of potential users is much higher than the number of line units. The projects have a structure-building effect because they illustrate that even in remote areas it is possible to establish an efficient basic infrastructure of telecommunication

services at acceptable costs. They can serve as a model and are replicable as shows the relocation of no longer needed RURTEL installations to other project sites. However, the projects' model character and replicability is subject to rapid change due to fast technical progress in the telecommunication sector and to the strong increase in demand that ultimately could be observed. Against this backdrop, the design of the forthcoming phase VI has been modified: instead of a mere RURTEL system, phase VI will also include exchanges, transmission technology and local cable networks. However, with its RURTEL projects implemented under phase III to V, Financial Cooperation (FC) has certainly fulfilled some kind of pilot function. Therefore, we classify the overall relevance/significance of the projects as satisfactory (sub-rating: 2).

- The specific cost schedules were adhered to and/or costs were even well below the planned figures. Thus, the sub-criterion of production efficiency has been fulfilled. As far as the allocation efficiency is concerned, the projections made in the appraisal reports indicated clearly that the projects would not be profitable or not sufficiently profitable. These expectations have been confirmed. However, this does not directly lead to a negative rating provided that the project-executing agency is still able to absorb negative cash flows in certain areas (through cross-subsidisation) within the system of nation-wide uniform tariffs. This is the case here. In addition, in terms of allocation efficiency it is important to stress that capacity utilisation of the facilities amounts to 100% and that the facilities are used intensively. This applies both to the present situation and probably also to the future situation. The developmental benefit, however, is lower than assumed during project appraisal, due to the unexpectedly rapid technical progress and thus, alternative technical offers (fixed telephone networks, mobile phone systems) were available in the project locations much earlier than assumed at the time of the project appraisal. Overall, we rate the efficiency of the projects as satisfactory (sub-rating 2).

After weighing the above mentioned key criteria for the evaluation of the projects' developmental success, we classify the projects as having an overall satisfactory degree of developmental effectiveness (rating 2).

General conclusions and recommendations

One conclusion applicable to all projects is that, although the project design based on RURTEL technology has proven its effectiveness in the projects subject to final evaluation here, technological alternatives have to be evaluated carefully in eventual new projects. Given the extremely dynamic development in the telecommunications sector with regard to technology, costs and tariffs, this will not be easy to achieve. Generally, however, the promotion of rural telecommunication projects through FC funds should remain an option also in the future if there is a developmentally relevant demand and if the private sector is reluctant to invest. This was also the message conveyed in the World Information Summit in Tunis in 2005.

Assessment criteria

Developmentally successful: Ratings 1 to 3	
Rating 1	**Very high or high degree of developmental effectiveness**
Rating 2	**Satisfactory developmental effectiveness**
Rating 3	**Overall sufficient degree of developmental effectiveness**
Developmental failures: Ratings 4 to 6	
Rating 4	**Overall slightly insufficient degree of developmental effectiveness**
Rating 5	**Clearly insufficient degree of developmental effectiveness**
Rating 6	**The project is a total failure**

Criteria for the Evaluation of Project Success

The evaluation of the "developmental effectiveness" of a project and its classification during the ex-post evaluation into one of the various levels of success described in more detail below concentrate on the following fundamental questions:

- Are the **project objectives** reached to a sufficient degree (aspect of project **effectiveness**)?
- Does the project generate sufficient **significant developmental effects** (project **relevance** and **significance** measured by the achievement of the overall development-policy objective defined beforehand and its effects in political, institutional, socio-economic and socio-cultural as well as ecological terms)?
- Are the **funds/expenses** that were and are being employed/incurred to reach the objectives **appropriate** and how can the project's microeconomic and macroeconomic impact be measured (aspect of **efficiency** of the project conception)?
- To the extent that undesired **(side) effects** occur, are these tolerable?

We do not treat **sustainability**, a key aspect to consider for project evaluation, as a separate category of evaluation but instead as a cross-cutting element of all four fundamental questions on project success. A project is sustainable if the project-executing agency and/or the target group are able to continue to use the project facilities that have been built for a period of time that is, overall, adequate in economic terms, or to carry on with the project activities on their own and generate positive results after the financial, organisational and/or technical support has come to an end.