

Chapter 1 Introduction

1.1 The Assignment

1.1.1 Project Background

Project LAO/90/M01/FRG "Labour-based Rural Road Construction and Maintenance" aims to develop a local capacity within relevant technical ministries to construct, rehabilitate and maintain rural roads using labour-based work methods supported by light construction equipment. Through demonstration sites located in varying topographical conditions, the project has so far constructed and maintained approximately 50 km of all-weather rural roads at maintainable standards in the two provinces, Savannakhet and Oudomxay. The project has chosen to carry out this work through the provincial road authorities by providing required training and direct on-site guidance. Based on the experience gained from the road works, the project aims to develop a strategy for the long term sustainability on rural roads construction and maintenance in Lao PDR.

The project was originally funded for a two year period by the Government of Germany. Technical assistance has been provided by the ILO through a team of four international experts, consisting of a Chief Technical Adviser, an Associate Expert and two United Nations Volunteers.

1.1.2 Scope of Study

This assignment has been commissioned by the ILO to assist the project in formulating a strategy document for labour-based road works in Lao PDR, based on the experience gained from project LAO/90/M01/FRG. More specifically, this exercise attempts to (i) review current as well as previous experience with labour-based works in the road sector, and (ii) assess the potential for the use of labour-based technology in future rural road works programmes, with the final objective of assisting the Lao Government in its efforts to effectively and efficiently manage and coordinate labour-based initiatives in the rural roads sector. Furthermore, this document could be of help in making an assessment of the prospects for a labour-based road works programme and of their commitment to such a programme.

Based on the review of labour-based works in the country, this report provides the rationale for defining the contribution this technology may have in the future development of rural roads in Lao PDR. In addition, this report outlines a medium-term plan for a labour-based road works programme, indicating in broad terms the resources and conditions required to effectively develop the rural road network in the country.

The original terms of reference are attached as Annex 1. The assignment was carried out from 20 November to 30 December 1996 and included travel to Vientiane. The itinerary and work programme and the list of persons consulted are shown in Annexes 2 and 3 respectively.

This is an appropriate moment to carry out this assignment, as significant changes are currently taking place in the country with regards to the Government's priorities in relation to rural infrastructure development. The donor community has responded to these changes and are now in the process of shifting their attention from assistance to major highway projects to supporting the development of the rural road network. In this context, it is worth mentioning that three major foreign actors in the Lao road sector, namely the World Bank, Asian Development Bank and the

Swedish International Development Cooperation Agency are now in the process of preparing major support programmes to improve rural roads in the country.

1.1.3 Plan of the Report

Before commencing on the detailed issues relating to planning and implementing a labour-based road works programme, it is important to clarify the exact meaning and contents of this technology. The remaining part of this chapter, provides a general background to, and definition of, the technology. Furthermore, this chapter presents the general economic situation of Lao PDR, and conditions prevalent in the rural areas as regards to infrastructure demand.

Chapters 2 to 4 presents a brief review of past and current road works where labour-based technology has been applied to improve and maintain rural roads and the current position of the Government and the donor community to the technology and its relevance to the rural road sector.

Labour-based road works technology has so far only been utilised to a limited extent in Lao PDR, mainly in pilot and demonstration projects. However, the general experience from these projects indicate that there is large scope for the expansion of the technology to become an integral part of the national strategy to upgrade the rural network. Chapter 5 provides a general assessment of this potential as related to the overall demands for improvement of the rural road network in Lao PDR.

In order to successfully implement a labour-based road works programme, it is important to design work methods and procedures, carefully taking into consideration local conditions prevalent in the country and the project areas. Based on past experience, Chapters 6 to 10 provides detailed guidelines on technical, financial and organisational issues important for a successful programme in Lao PDR.

1.2 Labour-based Methods - A Definition

1.2.1 History

More than 80 percent of the population in Lao PDR live in the rural areas. Although Lao PDR is presently experiencing a significant economic growth, very little of this contribute to the improvement of the living conditions in the rural areas.

The rural poor are not integrated in the national economy, many are undernourished, illiterate and ill housed, and they are easy victims of floods, famines and epidemics.

Traditionally, policy makers in developing countries have been reluctant to see the potential of making efficient use of the under- and un-employed labour in the provision of rural infrastructure. Notable exceptions were some Asian nations such as India, Pakistan, Indonesia and China, where labour traditionally has been used in all types of construction works. Many developing countries, including Lao PDR, imported construction methods that made extensive use of heavy equipment.

The reliance on equipment-based, high technology, construction methods has evolved for a number of reasons: the desire of politicians and engineers to emulate the more developed countries, the tendency among international consultants and contractors to favour construction methods with which they are familiar, and the biases inherent in the tied-aid stipulations of international and bilateral assistance agencies, the concern of the latter being to help exports of their own countries. A particular important factor has been the educational background of the technical leadership in most developing countries. Often acquired in engineering schools that advocated the latest technology and production methods this background conditioned planners and engineers to favour the use of heavy equipment in all circumstances. Equipment-based methods were perceived to have productivities, costs and

performance that were predictable; they were associated with high quality results; and they were surrounded by an aura of technological progress. Hence, the use of equipment in construction was particularly attractive and in some cases unavoidable, since financing would not otherwise have been forthcoming.

At the same time, the substitution of labour for machines appeared to have negative connotations. Large numbers of labour are needed to approach the output of a single piece of equipment. Doubts were entertained about the ability of unskilled workers to produce high quality work. Labourers were regarded as being undisciplined, unruly, unreliable and consequently, requiring extensive supervision. In sum, the extensive use of labour was judged to increase the risk of higher costs, to bring about longer construction periods, and to produce results of dubious technical quality. These risks tended to make public sectors in most developing countries - the front line of potential users - resist the use of unskilled labour in construction.

Reliance on equipment has shown to have some disadvantages, however. It resulted in a technological dependence on the countries that provided the equipment. Equipment-based operations also entailed heavy expenditures of foreign exchange. Such costs might be an unavoidable burden for urgently needed high technology projects. But for the construction of smaller, more scattered and technically less demanding rural projects, politicians and administrators began to look for ways to put local resources to work. If much of the work could be done by hand, the rural poor would not only receive the benefits of the finished product but would, in addition, secure the much needed income from its construction, considerable employment from its maintenance, and a sense of participation, civic pride and unity.

1.2.2 Definition

There are several categories of construction programmes that use large numbers of unskilled labour:

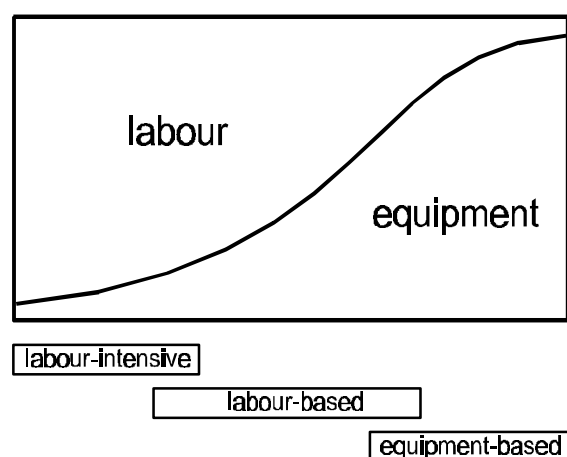
- o Relief Programmes responding to natural or man-made catastrophes, (i.e. droughts, severe floods, war, etc). Their prime objective is to provide food and income to the affected individuals. Although such programmes may also improve infrastructure, this is considered as a by-product.
- o Employment Generation Programmes - These projects give little attention to cost and quality effectiveness. Once more, asset creation is a secondary objective.
- o Asset-Creation Programmes - These attempt to improve infrastructure at the lowest possible cost, maintaining accepted quality levels and applying the most *appropriate* technology. Simultaneously, they supply employment opportunities in the rural areas, providing supplementary cash income to farmers. A sub-category is self-help programmes, which are schemes that do not pay wages to their workers, since the labour is regarded as the ultimate beneficiaries and owners of the created assets, and the project is merely an attempt to assist them in helping themselves.

This document focuses on the planning and implementation of the latter category of programmes, and more specifically, how this type of programmes can be organised in the rural road sector of Lao PDR.

An "appropriate" technology is defined as one that is both technically and economically efficient for a defined level of quality. Thus, appropriate construction technology exists over the entire range of methods. In each case, the appropriate mix of labour and machines will be determined by the technical nature of the project, available resources, prevailing prices and the socio-economic environment in which the project is executed.

The labour-based approach starts from the position that labour is a relatively abundant and cheap local resource during large periods of the year, if not throughout the year, and thereby seeks to

determine the most appropriate work methods.



To avoid a common misconception, it is important to distinguish between labour-based methods and labour-*intensive* methods. In contrast with labour-based technology, the labour-intensive approach seeks to maximise the use of labour with minimum use of mechanised equipment, often at the expense of cost and quality efficiency.

Labour-based technology can be defined as the construction technology which, while maintaining cost competitiveness and acceptable engineering quality standards, maximises opportunities for the employment of labour

(skilled and unskilled) together with the support of light equipment and with the utilisation of locally available materials and resources.

1.3 The Laotian Context

1.3.1 General

Lao PDR is distinguished topographically by a very mountainous area extending north and south throughout most of the country and a small area of lowland on the southern and southwestern borders. The mountainous area, which covers about nine-tenths of the entire country, can be divided into a northern section of heavily forested mountain ranges and plateaus cut by deep, narrow valleys and gorges and a southern section containing more sparsely forested limestone terraces. As a result of this rugged terrain and long distances between settlements, internal and external communications become difficult and costly.

The main climatic features are determined by the monsoons. The wet summer season prevails from about May to October, with rainfall averaging about 1780 mm, and a dry cool season extends from about November to February. The remainder of the year is hot and humid.

Lao PDR is a landlocked country with most of its natural resources unexploited or unsurveyed. The economy remains small and undiversified, with a per capita income estimated at about US\$ 335, making it one of the least developed countries in the world. The economy is dominated by agriculture which accounts for about 60% of GDP and two commodities (timber and electricity), providing about 70% of export earnings. As such, the economy is vulnerable to climatic conditions and external factors beyond the Government's control. This, coupled with a weak human resource base, presents the country with a major challenge to development.

Among Asian countries, Lao PDR has one of the most undeveloped road networks. During the past nine years, Lao PDR has been investing between US\$ 20 and 45 million annually in road rehabilitation. While these investments are sizeable in terms of total capital budget of the Government, the effect on the overall length of the road network has been limited. The past decade's investments have added approximately, 200 km of improved new roads each year, i.e. about 2 % of the national and provincial road network.

With few exceptions, road improvement works has mainly been focusing on establishing a functionable trunk road network in the country. The main emphasis of these investments has been on two major components, (i) Road 13 from Pakse in the south to Pakmong in the north and (ii) in roads

providing access to the rich agricultural and densely populated area on and around the Bolavens Plateau in the south.

Until recently the provincial and district road network has received little attention.

1.3.2 Rural Access

Isolation is a fundamental cause of poverty. Isolation is reflected in the lack of access of the population to goods and services. If the population has no access to basic services such as water supply, health and educational services, they will even be unable to satisfactorily meet their basic needs. In addition, lack of access to, or isolation from, technology, agricultural inputs, markets and outlets for cash crop production means that there is neither the incentive nor the capability to generate economic surplus. Moreover, lack of access to information and to available government services means that the population is cut off from the mainstream of economic and social development in the country.

The important point here is that lack of access is a major factor contributing to the continuing poverty of the rural population. Major efforts are now being undertaken to improve the social and economic situation in the country. Nevertheless, it is vital that the problem of access is tackled in a comprehensive and integrated manner.

Therefore, a shift in emphasis towards improving and maintaining provincial, district and other rural roads is justified. Road infrastructure is limited and where it does exist, it is poorly maintained, causing a serious constraint to economic and social development.

That being said it should be recognised that in the poorer provinces, the immediate potential for economic development is also limited. Most households barely produce enough rice to be self sufficient. Roads cannot, in the first instance, lead to significant increases in income. The immediate benefits are likely to be improved access to health and education. However, without proper roads, it is difficult to provide the basic social services which may in the second round result in increased social and economic development.

Roads therefore are a necessary but not sufficient element in rural development in Lao PDR. These roads could also contribute directly to the benefit of the rural population through the use of labour-based methods.