

*Strategy Document for a Labour-based Programme in
Jabalpur District, Madhya Pradesh*

Prepared by

*Kirit Vaidya
Labour-based Consultant to
ASIST-AP, International Labour Organisation
Bangkok*

January, 2002



In collaboration with:

*Ministry of Labour
Government of India*

ILO Area Office for India and Bhutan,

CONTENTS

| | |
|---|-----------|
| Abbreviations, exchange rate and terminology | 4 |
| EXECUTIVE SUMMARY | 5 |
| 1. BACKGROUND AND INTRODUCTION | 8 |
| 2. THE LABOUR-BASED APPROACH | 10 |
| 3. POLICY ON LABOUR-BASED METHODS: GOI AND MADHYA PRADESH | 14 |
| 4. SCOPE FOR LABOUR-BASED WORKS IN JABALPUR | 16 |
| 4.1 Introduction | 16 |
| 4.2 Rural roads | 17 |
| 4.2.1 Public Works Department (PWD) and rural roads | 18 |
| 4.2.2 DRDA, employment generation and poverty alleviation schemes and rural roads | 20 |
| 4.2.3 EAS (Employment Assurance Scheme), JGSY (Jawahar Gram Samrudhi Yojana) and Sampurn Gram Rojgar Yojana (SGRY) | 20 |
| 4.2.4 MPs' and MLAs' funds | 22 |
| 4.2.5 RES and rural roads | 22 |
| 4.2.6 PMGSY and rural roads | 23 |
| 4.2.7 Main lessons on organisational structure and financing for rural roads | 25 |
| 4.3 Urban authorities, District Urban Development Authority (DUDA) and infrastructure works | 26 |
| 5. OPERATIONAL AND TECHNICAL ASPECTS | 28 |
| 5.1 Introduction | 28 |
| 5.2 Contractor classification and operations | 28 |
| 5.3 Implementation | 30 |
| 5.3.1 Construction / rehabilitation activities on a major district road (MDR) by a contractor for PWD | 30 |
| 5.3.2 Short urban road projects by small / medium sized contractors | 31 |
| 5.3.3 Rural WBM and murrum road construction by RES | 33 |
| 5.4 Labour: Recruitment, supervision and payment | 33 |
| 5.5 Tools and Equipment | 34 |
| 5.6 Maintenance | 35 |
| 6. ROAD CONSTRUCTION AND REHABILITATION COSTS | 36 |
| 6.1 Introduction | 36 |
| 6.2 RES cost estimates: WBM and murrum roads | 36 |
| 6.3 PMGSY cost estimates and comparison with a lower cost option | 39 |
| 7. CONCLUSIONS AND AN OUTLINE FOR LABOUR-BASED STRATEGY AND PILOT PROJECTS | 43 |

LIST OF TABLES

| | | |
|-----------------|---|-----------|
| Table 1 | Checklist of characteristics of the labour-based model | 13 |
| Table 2 | Tehsils and blocks in Jabalpur district | 16 |
| Table 3 | Broad road system classification in India | 18 |
| Table 4 | Length of roads (kms) in Jabalpur District (MP): By classification and surface type | 18 |
| Table 5 | Allocations under EAS and JGSY, 2001-2 | 21 |
| Table 6 | Length of roads connecting villages in Jabalpur | 24 |
| Table 7 | Classification of contractors and estimated numbers in Jabalpur | 29 |
| Table 8 | Summary information from three short urban projects | 32 |
| Table 9 | RES WBM specification: quantities and costs per km (excluding culverts and bridges) 37 | |
| Table 10 | RES murram specification: quantities and costs per km (excluding culverts and bridges) 38 | |
| Table 11 | Preliminary estimate of cost per km of different types of treatment to construct a BT road under PMGSY in Jabalpur | 39 |
| Table 12 | PMGSY in Jabalpur: Programme costs by treatment - alternative assumptions | 40 |
| Table 13 | PMGSY in Jabalpur: Programme costs under alternative assumptions - summary table | 41 |
| | References | 45 |
| Annex | Terms of reference for labour-based consultant | 46 |

Abbreviations, exchange rate and units

Abbreviations

| | | |
|-------|---|---|
| BT | - | Bitumen surface |
| CRF | - | Central Road Fund |
| EAS | - | Employment Assurance Scheme |
| DRDA | - | District Rural Development Authority |
| GOI | - | Government of India |
| IRAP | - | Integrated Rural Accessibility Planning |
| JGSY | - | Jawahar Gram Samrudhi Yojana (Jawahar Village Prosperity Scheme) |
| MOL | - | Ministry of Labour |
| MP | - | Madhya Pradesh |
| MPRRA | - | Madhya Pradesh Rural Roads Authority |
| PWD | - | Public Works Department |
| PMGSY | - | Pradhan Mantri Gram Sadak Yojana (The Prime Minister’s Village Road Scheme) |
| RES | - | Rural Engineering Service |
| SGRY | - | Sampurn Gram Rojgar Yojana (Integrated Rural Employment Scheme) |
| WBM | - | Water Based Macadam |

Exchange rate used in this report (21/12/01):

US\$1.00 = 47.82 Rs (Indian Rupees)

“Lakh” and “crore”

The Indian unit “lakh” represents 100,000 and “crore” represents 100 lakh or 10,000,000.

EXECUTIVE SUMMARY

The labour-based approach

Following an ILO mission to India in 2001, an initiative by the ILO to support poverty alleviation and employment generation was proposed. As a part of this initiative, this report makes a preliminary assessment of the possible role of the labour-based approach to infrastructure works in Jabalpur district in Madhya Pradesh (MP). The labour-based approach uses an appropriate combination of locally available and cheaper resources, especially labour, with light equipment in constructing, rehabilitating and maintaining the infrastructure. In order to avoid setting too wide a scope, the focus during this mission was on rural roads.

The labour-based approach makes a broader contribution than simply use of appropriate construction and maintenance technologies. It is also concerned with the development of sustainable models for improving and maintaining rural roads which encompass (a) development of technical, project management and planning capabilities, (b) setting up an appropriate structure for planning and implementing, (c) determining the level of improvement for roads, based on accessibility requirements and economic cost-benefit considerations, and (d) ensuring realistic and stable levels of funding.

Conditions for a labour-based approach in India and MP

A number of circumstances are favourable for the introduction of labour-based methods in MP. Private contractors and public sector agencies (Rural Engineering Service and PWD) use labour in a number of activities because of its low cost. There is a well developed labour market and pay according to performance is accepted. Typically, labour contractors are responsible for recruitment, supervision and payment of labour. Locally produced tools and light equipment are also available and the latter can be hired at reasonable rates.

The policy environment is also broadly conducive. However, it is necessary to make a distinction between the labour-based approach and labour-intensive schemes such as the Employment Assurance Scheme (EAS) and the Jawahar Gram Samrudhi Yojana (JGSY). The stated primary objective of these schemes is employment generation for the rural poor with rural infrastructure improvement as a secondary objective whereas the primary objective of labour-based methods is to use appropriate combinations of labour and light equipment to construct and maintain sound infrastructure.

Agencies involved in rural roads construction and maintenance

A number of agencies are involved in constructing different categories of rural roads and, in principle, have responsibility for maintaining them. The PWD is responsible for Major District Roads (MDRs) with project funding for construction and rehabilitation. Until last year, the main sources of funding for Other District Roads (ODRs) and (Village Roads) VRs were EAS and JGSY. Other small infrastructure works compete with roads for resources from these funds.

PMGSY is a new scheme specifically directed at improving the network of ODRs and VRs. The stated objective of PMGSY is to upgrade all roads linking villages with populations in

excess of 500 persons by bitumen surfaced (BT) roads. A number of reasonable arguments have been put forward in support of the overall strategy of the PMGSY to improve these roads to BT surface level through large contracts. In summary, these are:

- concern with the quality of rural infrastructure works in the past and on the current employment generation programmes;
- lack of technical and management capacity of small local contractors and in the implementing agencies, and
- lack of adequate maintenance provision and arrangements for implementing it.

Finance and cost considerations

Although GOI has made a major resource commitment to PMGSY by allocating half the revenue from a new tax on diesel to it, funding is likely to fall short because of the scale of the programme and the decision to upgrade all qualifying roads to a BT surface irrespective of the initial condition of the road, accessibility requirements and traffic volumes. Construction of some roads to a BT standard may be justified because of traffic volumes but lower cost labour-based options are needed for roads serving smaller populations and lower traffic. A World Bank assessment of evidence from Andhra Pradesh suggests that a BT surface is unlikely to be justified for a road serving a population below 3000 unless it also serves another economic function.

Data from RES show that the average estimated cost of WBM roads by largely labour-based methods are about Rp 400000 (US\$8300) per km excluding contingencies of 20%. Based on these data, the cost of murrum roads was estimated to be about Rp 323000 (or US\$6800) per km, again excluding contingencies. Precisely comparable costs for BT surface roads constructed under PMGSY are not available. However, for full construction, a low estimate of Rp 780,000 (or US\$16,000) and a high estimate of Rp 1,500,000 (or US\$30,000) were quoted.

Some rough indicative cost estimates for upgrading all roads connecting villages with populations (a) above 1000 persons and (b) above 500 persons by BT roads and by lower cost WBM and murrum options were also made. Depending on a number of factors which need closer examination, the total cost of labour-based upgrading to a combination of BT, WBM and murrum surfaces (depending on the initial road surface) could be up to 67 per cent lower than the cost of upgrading all roads to BT standard.

Strategic and operational aspects and recommendations

The labour-based option of rehabilitating to a lower specification where this is justified, offers the advantages of (a) lower cost per km and the stretching of resources for the improvement of more roads and (b) higher employment for a given level of expenditure because the labour contents per km for WBM and murrum roads are typically higher than for BT roads.

Implementation of the approach requires attention to a number of planning, operational and technical issues. The foremost planning issue is that there is no single agency responsible for developing a strategy for the rural road network at the MP State level and making and implementing plans for the improvement and maintenance of the network. The role of a strategic rural roads agency would be to:

- (a) collect information on and assess the present condition of the rural roads network and the access it provides and not just on the type of road surface;
- (b) develop guidelines for determining the appropriate types of rehabilitation, upgrading and maintenance based on the initial road condition, road function and available resources;
- (c) assess requirements for donor support, technical assistance and additional funding to support the heavy initial rehabilitation investment to bring the network up to a maintainable standard;
- (d) assess requirements for improving technical and management capabilities in public agencies and for private contractors and plan training activities;
- (e) make an assessment of resource requirements for a continuing sustainable programme of rehabilitation / upgrading and maintenance, and
- (f) make long-term plans based on available resources.

Development of a strategy requires studies and experiments related to technical and operational aspects in the field. These include:

- (a) assessment of the suitability of existing options (WBM and murrum) as alternatives to BT roads on lower traffic volume roads;
- (b) experiments with labour-based construction and contractor operation on pilot projects to test and develop alternative methods and develop contractor capacity;
- (c) set up alternative maintenance methods on pilot projects with a view to assessing the suitability, resource and management requirements of alternative approaches, and
- (d) examination of design specifications to make them more suitable for labour-based methods or more appropriate for local physical, climatic or traffic requirements, and recommendation of changes if necessary.

A strategy for rural roads should also define the role of the employment generation oriented schemes (EAS and SGRY). With appropriate technical support within properly set out agreements, there is a role for community-based rehabilitation which works well if the assets being maintained are of direct, and largely exclusive, benefit to the community. In the context of local democracy in MP, local institutions are the focal points for expressing local needs, for planning local community works, and identifying and proposing projects to higher authorities and agencies. Integrated Rural Accessibility Planning (IRAP), as a participatory planning method for analysing the access situation at the local level and aiding the process of establishing priorities, would make an important contribution to local level establishment of priorities and planning.

In summary, the report recommends ILO support at three interrelated levels: (a) the setting up of a rural roads agency at the MP State level, (b) labour-based rehabilitation and maintenance pilot projects in Jabalpur district and (c) an IRAP project in Jabalpur district.

I. BACKGROUND AND INTRODUCTION

Employment generation has been identified by the Government of India (GOI) as the topmost national priority. At the request of the Ministry of Labour (MOL), an employment sector mission was undertaken by the ILO in July / August 2001 to initiate discussions on possible ILO support to GOI on job creation and poverty reduction. The mission proposed a “two-track” approach to ILO support which was accepted by the Ministry of Labour (MOL). One of the tracks is the development of policy perspectives on employment as a route out of poverty while the other is the development of an integrated approach to job creation and demonstration of the approach through pilot action programmes in selected areas (initially four districts in four different States). Jabalpur District in Madhya Pradesh (MP) is one of the selected districts.

The choice of MP as one of the states for the ILO initiative is justified because MP is one of the poorest states in India with low per capita income (Rp 7571 or US\$158, about 70 per cent of the Indian per capita income in 1996-7), high poverty incidence (42.5 per cent of the population below the poverty line in 1993-4 compared with the Indian average of 36.0 per cent), the second lowest Human Development Index in India and a poorly developed transport infrastructure. The latter is indicated by (a) the low density of roads in comparison with the rest of India (though this is partly explained by the large area and low population density of the state), and (b) the poor condition of the road network. For more details on these and other development indicators see www.mp.nic.in.

The choice of Jabalpur as the pilot district is also reasonable as it is one of the poorer districts in MP, ranking 7th out of 45 in degree of poverty and 20th according to the Human Development Index. According to the 1991 census, the population of the district was about 1.8 million (18 lakh) of which about 49 per cent was rural. The population estimate based on the 2001 census is about 2.6 million (26 lakh).

A labour-based approach to infrastructure programmes is often an important component of an overall employment-oriented government policy. Jabalpur is the first district in which the role of labour-based projects is being examined under this initiative alongside with the contribution of local economic development and micro-finance strategies to employment creation. Studies under this initiative have already started in Muktsar district in Punjab. These do not include assessment of the labour-based approach at this stage. Work in the other two districts (Chittur in Andhra Pradesh and Cuttack in Orissa) is expected to start in 2002.

The core of the labour-based approach is the use of locally available and cheaper resources, especially labour, to develop and maintain the infrastructure more cheaply while at the providing an additional employment opportunity. The approach is also concerned with the development of a sustainable model for improving and maintaining the rural infrastructure. This requires (a) local technical, project planning and planning capabilities, (b) adequate resources, (c) an appropriate institutional structure and (d) economically rational strategy on project selection and the type and level of infrastructure improvement.

The main objectives of this document are to:

- (a) assess the feasibility and value of a labour-based infrastructure development and maintenance approach in Jabalpur;
- (b) propose a pilot labour-based project for the district, and

- (c) make some broader recommendations for the development of a labour-based strategy at the state level.

The terms of reference for the assignment have been set out in annex I.

The policy environment is conducive for labour-based methods in Jabalpur in particular and MP and India in general (see section 3 for more detailed discussion). Implementing agencies and contractors also use close to labour-based methods in many instances. However, there is also some resistance to the use of labour-based methods because of experience with labour-intensive employment generation schemes. In this context, the contribution of this document is to make recommendations on strengthening the labour-based approach and enhancing its contribution to effective development and maintenance of the infrastructure.

The labour-based approach is suitable for construction, rehabilitation and maintenance of a range of infrastructure including roads, land reclamation, minor dams, wells and irrigation systems and drainage. However, to avoid setting too broad a scope, the emphasis in this document will be on the rural transport infrastructure, and especially roads, serving the rural population. This is an important sector to focus on because of the importance of roads for the economic and socio-economic activities of the rural population, the poor state of many rural roads and the high priority given to the improvement of the rural road network both by GOI and the MP State Government. The high amount of investment needed and the continuing maintenance also offer significant employment generation opportunities.

The rest of this document is organised as follows:

- (a) Section 2 introduces the labour-based approach. It explains the rationale underlying the labour-based approach, makes a distinction between the labour-based and the labour-intensive models and outlines the institutional and sustainability issues associated with the labour-based approach.
- (b) Section 3 sets out the broad government policy context for the labour-based approach in MP.
- (c) Section 4 briefly introduction the main types of civil infrastructure works and programmes and the agencies responsible for them. The programmes and agencies responsible for rural roads, financing arrangements and availability of resources are considered in more detail. The following sections set out aspects of current operational and technical practices and costs in more detail.
- (d) Section 5 outlines current planning and project implementation practices and their compatibility with the labour-based model.
- (e) Section 6 sets out the available information on the costs of construction and rehabilitation of rural roads to different specifications.
- (f) Conclusions and an outline for a labour-based project in Jabalpur and strategy formulation at the MP state level are set out in section 7.

2. THE LABOUR-BASED APPROACH

2.1 Rationale

The labour-based approach to rural infrastructure investment and maintenance in developing countries, and especially in rural areas, has evolved as a response to a combination of circumstances. A large proportion of the population in developing countries lives in rural areas and is typically poorly served by the transport infrastructure. This is understandable because of the high cost of providing an adequate transport network for a dispersed population. With limited funds (and shortage of foreign exchange for importing road construction equipment, parts and fuel in many countries), governments have understandably directed their resources and efforts towards improving the major arterial transport network. Even where resources are directed towards rural roads, operation of heavy construction equipment in rural areas is problematic because of the high cost, difficulty of maintaining equipment adequately and stoppages because of breakdown of equipment and delays in obtaining spare parts and repairing them.

In many rural areas, underemployment, in particular in the agricultural slack seasons is a problem and off-farm employment seeking is an integral part of economic activities. In addition, in some countries, a substantial proportion of households are landless and therefore have to rely on farming and non-farming employment for their livelihoods. In response to the shortage of resources, the problems and costs associated with heavy equipment in rural areas and availability of relatively cheap labour, greater reliance on local resources, especially labour for the development and maintenance of the rural infrastructure, appears to be an attractive option.

The “labour-based” approach starts with the premise that given the cost of labour, there are a number of road construction and maintenance activities which can be performed more cheaply by labour using appropriate, good quality hand-tools and supported by light equipment. The approach then seeks to determine an appropriate (technically effective and economically efficient) combination between labour and light equipment for the relevant activities. The term “labour-based” is used to make a distinction between this model which aims to use the appropriate combination between labour and equipment to produce properly designed and engineered roads and other infrastructure and purely employment generation labour intensive projects and programmes which have the objective of maximising employment, use the minimum of equipment and where the creation of the infrastructure is a secondary objective.

There is no single labour-based model appropriate for all circumstances. It has to be adapted in accordance with the local physical and economic conditions and the technical requirements. The model also evolves in response to development of technology and equipment. An example is the replacement of larger tractors and animals by single axle tractors for pulling trailers and other light equipment. Depending on local manufacturing capability, labour-based projects have often stimulated local development and manufacturing of light construction equipment.

2.2 ILO Experience

An overview of the labour-based approach promoted by the ILO among others is provided by Edmonds and de Veen (1992). Since the mid-1970s there have been labour-based projects in some 22 countries and a number of larger programmes such as the Rural Access Roads Programme (RARP) followed by the Minor Roads Programme (MRP) in Kenya; the Feeder Roads Programme in Ghana; and the District Road Improvement and Maintenance Programme (DRIMP) in Malawi. At its peak, the Kenyan RARP was constructing 1,200 km of roads and generating about 1.9 million work-days of employment per year. The programme also created longer-term employment in maintenance for about 4,000 people per year using the 'length man' system.

Various studies have shown (Keddeman, 1998) that labour-based techniques can be more cost-effective than equipment-based techniques. In Lesotho, for example, a comparative analysis showed that the cost of labour-based road construction was 37 per cent below that of equipment-based construction in remote mountainous areas with a daily wage rate of US\$4.90. In Madagascar, labour-based road projects implemented through small-scale local contractors were 30 to 80 per cent lower in cost than equipment-based projects executed directly by the Government. In addition, they generate two to three times more employment. However, labour-based projects are supervision-intensive and therefore their cost-effectiveness is closely linked to the quality of management and organisation.

While the labour-based model has economic and socio-economic advantages over the equipment-based model, there is resistance to its acceptance. This is partly because of the bias in civil engineering education in favour of equipment and partly because of concerns about the operational and technical efficacy of the labour-based method. The main concerns on operational and technical efficacy are the slowness of the works, the problem of managing labour and the difficulty of ensuring adequate quality.

There are two responses to the concern about slowness. The first is that by employing a sufficiently large number of workers in an activity and organising them well it would be possible to match the speed of equipment operation. The second response is that where rural roads have been neglected over long periods of time, speed in completing the project marginally faster does not make a significant difference. Evidence from projects in many countries shows that with competent project management, supervision and organisation, labour-based methods achieve good quality and completion of work to required specifications. In summary, concerns about operational and technical efficacy can be satisfactorily addressed by a well executed labour-based approach as has been demonstrated on numerous projects in different parts of the world.

By being more reliant on local resources, especially local labour, the approach is potentially more sustainable than the equipment based model. However, for it to be more robust and sustainable in the longer term, it needs to be more reliant on (a) local skills and capabilities; (b) locally available materials, and (c) a secure and reliable level of funding. Relevant skills and capabilities are required in the implementing and planning agencies as well as in the private sector contracting firms. These can be developed through training programmes and during the pilot and early stages of a labour-based project.

Attention should also be paid to the appropriate type and level of road construction. For example, for low traffic volume roads, construction to a bituminous surface may not be justified on economic grounds. Further, for a given amount of resources, it is important to construct roads to the appropriate level taking account of accessibility requirements and cost-benefit considerations, so that the available resources can be stretched to as many roads as possible providing accessibility to a larger proportion of the population. For example, if a bituminous surface road costs US\$18,000, while upgrading to a gravel surface costs US\$9,000, twice as many roads can be constructed from the same budget.

There are also technical issues related to the choice of upgrading level and design specifications. Upgrading to a gravel road would give local medium sized contractors a better chance of competing with larger contractors. Development of local contractor capacity and more reliance on local materials also needs more flexible contract procedures and specifications. Design specifications constitute an important barrier to the participation of local contractors in road works. Specifications are generally rigid in terms of compaction standards, thickness of base and sub-base and quality of materials. A less rigid approach permitting replacement of high quality densely compacted materials with thicker layers of locally available lesser quality material to slightly lesser density could allow local contractors to compete and reduce costs.

Sound maintenance arrangements are also an important component of the labour-based approach. The length-person system under which a person is responsible for a short stretch of a road (for example one or two km) or employment of petty contractors responsible for longer road lengths has been found to be effective for routine and some periodic maintenance. However, such systems require adequate supervision, payment related to performance and adequate and reliable funding. In addition to protecting investment in roads and sustaining the benefits of an improved road surface, labour-based maintenance also creates regular employment albeit on a small scale.

2.3 Institutional Issues

The labour-based approach outlined above and summarised in table 1 refers to infrastructure programmes typically based in technical ministries or agencies (e.g. ministries of transport, rural roads agencies in ministries of rural development or ministries of agriculture for irrigation). Their tasks are to build or maintain specified infrastructure to specified standards within budget constraints and, typically, formally laid down procedures for awarding contracts.

A distinction should be made between the labour-based approach to public works planned, financed and managed by government agencies, as described above, and community based projects undertaken on the initiative of and /or for the benefit of local groups. A variation on the latter is where the government uses such projects as vehicles for employment generation and poverty alleviation and supports them with financial and technical assistance. Projects may include schools, health centres, village water supply and short access roads. In such cases, local institutions are the focal points for expressing local needs, for planning local community works, for mobilising local resources and for negotiating external financial and technical support.

The role of public agencies for such community based projects would be to provide appropriate technical support to assist the communities to construct the infrastructure to a good standard and maintain it. Sometimes formal maintenance agreements between the local community and the agency are entered into. The community agrees to provide the labour and the agency agrees to provide technical support and some financial assistance. Such maintenance agreements work well if the assets being maintained are of direct, and largely exclusive, benefit to the community.

Rural communities may also need assistance in examining their accessibility needs and problems, for example whether the village population has adequate access to drinking water, social services and markets. Integrated Rural Accessibility Planning (IRAP) is a participatory planning method designed for use at a local level to analyse access to essential services. IRAP plans describe the present accessibility situation, the value of the existing key local assets and the interventions that will have the greatest impact on local accessibility. It recognises the need to manage rural assets in such a way that investments are always increasing the overall asset value. The plans prioritise investments, and include cost estimates for both maintenance and construction.

The checklist of the characteristics of the labour-based model in table 1 has been used to assess the scope for labour-based methods in Jabalpur and policy implications at the MP State level in later sections.

Table 1 Checklist of characteristics of the labour-based model

| |
|--|
| <i>The labour-based model</i> |
| Appropriate combination of labour, hand-tools and light equipment for economically efficient and technically effective infrastructure works (construction, rehabilitation and maintenance) |
| <i>Economic and socio-economic benefits</i> |
| Use of cheaper and underutilised resources (especially labour but also locally available materials) |
| Additional local employment opportunities typically for unemployed or underemployed persons |
| Lower cost of infrastructure works |
| Development of local implementation capacity (infrastructure construction and maintenance and project management) |
| Development of local tools and equipment manufacturing capability |
| Development of a locally sustainable model for infrastructure works |
| <i>Requirements</i> |
| Design specifications compatible with labour-based methods and flexibility to make better use of locally available materials |
| Training for private contractors and staff in implementing agencies |
| Effective supervision and management of contractors |
| Effective supervision and management of labour and payment methods (including timely payment for contractors and labour) |
| Appropriate level of road specification for better and more appropriate use of resources |
| Adequate routine and periodic maintenance arrangements |
| Effective information system |

3. POLICY ON LABOUR-BASED METHODS: GOI AND MADHYA PRADESH

GOI and MP State Government policy statements put a high priority on employment creation and there are a number of infrastructure and other civil works programmes (both rural and urban) with the objective of generating employment. Implementers of infrastructure construction and maintenance projects (public sector as well as private contractors) outside the employment generation programmes have also traditionally adopted more labour-intensive methods than elsewhere because of the low cost of skilled and unskilled labour and the high cost of equipment operation. Indeed, some of the early studies which contributed to the development of the labour-based approach internationally were carried out in India (for example, see Green and Brown, 1976, and Sud, Harral and Coukis, 1976). Therefore, in general the policy environment would be expected to be conducive for a labour-based approach.

However, the experience in India with large scale rural infrastructure programmes with greater emphasis on employment generation and poverty alleviation than the creation of sound infrastructure, creates some difficulties for labour-based initiatives. Review of earlier rural programmes in India (Tiwari, 1990; Hirway and Terhal, 1994 and Relf and Vaidya, 1998) shows that while they had an impact as welfare schemes for poor sections of the rural population, their effectiveness in creating sound and necessary infrastructure was limited. The main problems were unsystematic project selection, insufficient technical supervision, poor infrastructure quality and inadequate maintenance arrangements.

The two major rural employment programmes currently in operation (now incorporated into the Sampurn Gram Rojgar Yojana, or SGRY, with two streams as described in section 4 below) are the Employment Assurance Scheme (EAS) and the Jawahar Gram Samridhi Yojana (JGSY). According to Planning Commission (2001), in 1998-99 (the last year for which complete figures were available) the total amount of employment created by the two programmes was 792 million person days or about 4.4 million person years (assuming 180 days of work per year). This is clearly a substantial absolute number but small in relation to the total size of the rural labour force of 300 million (about 1.5 per cent). The schemes are targeted at the rural poor, estimated to be about 30 per cent of the rural labour force. Therefore, the employment created is about 4.5 per cent of the rural poor labour force.

Government evaluations (including those by the Programme Evaluation Office of the Planning Commission) found that the programmes faced a number of problems resulting in lower local employment created than expected and inappropriate project selection. The provision for maintenance in the programmes is also not effective. The recent restructuring of the programmes is intended to deal with some of these issues. SGRY will continue in its role of employment generation for the rural poor as the primary objective with rural infrastructure improvement as a secondary objective. The Pradhan Mantri Gram Sadak Yojana (PMGSY), or the Prime Minister's Rural Road Scheme has recently been launched as a major initiative to improve rural roads. The scheme represents a very substantial resource commitment on the part of GOI to the improvement of the rural transport infrastructure. Potentially, it offers scope for the introduction of labour-based methods. However, the initial design of the programme (to use large contractors to connect all villages with population above 500 persons by bitumen surface rural roads) somewhat reduces the labour-based potential of the scheme.

There is also an urban employment generation programme, the Urban Wage Employment Programme (UWEP), which seeks to provide wage employment to persons below the poverty line in urban areas with population below 500,000. The total employment created was small in relation to the size of the urban labour force, about 56,000 person years or less than one-tenth of one per cent of the urban labour force. There are other urban employment generating infrastructure programmes such as the National Slum Development Programme (NSDP) and expenditure by urban authorities which have a much larger impact in Jabalpur. These are briefly reviewed in the next section.

In other parts of the world where the labour-based approach has made a contribution, the initial situation has been lack of resources and an equipment-based approach failing to provide an adequate service to the rural population. With the acceptance of a labour-intensive approach to infrastructure works, albeit with a greater emphasis on employment generation, the policy context in India in general and in Jabalpur and MP in particular is favourable for a labour-based approach. Nevertheless, as noted above, there is some reaction against the use of labour and reliance on local resources and capabilities for creating sound infrastructure (evidenced by the structure of PMGSY) because of experience with labour-intensive employment generation and poverty alleviation programmes. It is therefore necessary to start with a brief description of the existing programmes which have the potential to be labour-based and the agencies implementing these programmes in order to identify more precisely the potential role of the labour-based approach and related institutional changes.

4. SCOPE FOR LABOUR-BASED WORKS IN JABALPUR

4.1 Introduction

Different organisations have responsibility for different types and levels of infrastructure works and the source of funds. The mode of operation and the institutional arrangements for the works also vary. The main types of infrastructure works suitable for the labour-based approach are:

- rural roads;
- other minor rural infrastructure works;
- irrigation schemes, and
- urban works such as roads, drainage and slum clearance.

As stated in section 1, the focus of this report is on rural roads. This section also briefly describes urban works because of the insights they provide into the mode of operations of civil works contractors. Other infrastructure works include small water supply schemes and buildings for schools and civic amenities alongside under the EAS and JGSY. There are also small scale water resource management projects under a GOI and MP State financed drought relief scheme and some drought relief work is also funded by UNICEF. On irrigation schemes, there is a major dam construction project (Bargi Dam) in progress and irrigation projects under Drought Relief, EAS and UNICEF is being undertaken by the Hiran Division of the MP State Water Resources Department.

Within the district, the administrative levels are *tehsils* (sub-districts), development blocks and villages. As table 2 shows, Jabalpur district consists of 4 tehsils and 9 development blocks. The blocks are used for the purpose of managing and directing development initiatives. They are designated as community development blocks or special blocks for more favourable treatment if a substantial proportion of the population is ST (scheduled tribes) or SC (scheduled caste). In addition, the PWD, Water Resource Department and RES have their own divisional boundaries within the district.

Table 2 Tehsils and blocks in Jabalpur district

| <i>Tehsil</i> | <i>Block</i> |
|---------------|--------------|
| Jabalpur | Jabalpur |
| | Panagar |
| Kundam | Kundam |
| Sihora | Sihora |
| | Majholi |
| Patan | Patan |
| | Shahpura |

The project identification and selection process varies, depending on the agency involved in implementation and the nature of schemes, but democratically elected groups at the village and higher levels play an important part in identification and selection and therefore they are briefly described here. There are three levels of panchayats or bodies of elected representatives at the gram (village), janpad (block), and jila (district) levels. In addition, there is the gram sabah (village meeting) where a quorum of 10 per cent of the adult

population is required. Proposals of direct interest to a village are generated by the gram sabah or panchayat but in some cases have to be approved at the higher levels. The gram panchayats and elected representatives are also responsible for project management in some cases. There are 1163 villages in Jabalpur but only 525 panchayats. This is because some villages do not have panchayats and in some cases, a number of adjacent villages have a common panchayat. Projects of interest at the block level or the district level are generated and approved at those levels.

4.2 Rural roads

As a number of agencies deal with rural road, this section starts with a brief overview of arrangements followed by more detailed description of the agencies and their operations with respect to roads. The PWD (Public Works Department) is responsible for the construction and maintenance of the more important rural roads. The sources of funds are allocations from the Central and State governments and funds for specific projects (grants and loans).

Until the start of the PMGSY in 2000, the main source of funding for the less important rural roads and village roads were the employment generation and poverty alleviation schemes, EAS and JGSY and funds allocated to Members of Parliament (MPs) and Members of the (State) Legislative Assembly (MLAs) for spending on projects in their constituencies. DRDA (District Rural Development Authority), under the stewardship of the District Collector, administers the EAS, JGSY, MP and MLA funds. Following the allocation rules, some funds are disbursed to representative bodies at the village or other administrative levels for implementation of small projects. Funds for larger projects are managed by DRDA and project implementation is by Rural Engineering Service (RES), an implementing agency for small scale civil works under the MP State Department for Rural Development. Representative bodies at the village and higher levels play a role in project identification, selection and implementation.

EAS, JGSY, MP and MLA funds are for all rural infrastructure works (mainly roads, buildings and water supply). PMGSY is a new scheme specifically directed at improving the network of less important rural roads. The funding for PMGSY is revenue from an additional tax on diesel imposed by GOI. At the State level, a new Rural Road Development Authority has been set up under the Department of Rural Development to plan and implement this programme.

In order to understand the role of the different agencies introduced above with respect to roads, it is necessary to put rural roads in the context of the road classification system start in India (Table 3). *National and State Highways* are the major national and state arterial roads. *Major District Roads (MDRs)* are the important roads within a district, serving areas of production and markets and connecting them with each other and with the main highways.

Other District Roads (ODRs) are roads serving rural productive areas and providing them with the outlet to market centres, tehsil (sub-district) headquarters, block development headquarters or other main roads. *Village Roads (VRs)* are roads connecting villages / habitations with each other and to the nearest road of a higher category. The PWD's road classification in Jabalpur district (table 4) does not make a distinction between ODRs and VRs. Further, more detailed surveys for the PMGSY (see section 4.2.6) show that, the estimate of 787 km of village roads in table 4 is an underestimate.

Table 3 Broad road system classification in India

| <i>Classification</i> | <i>Road Types</i> |
|------------------------------|---|
| <i>Primary Road System</i> | Expressways and National Highways |
| <i>Secondary Road System</i> | State Highways (SH) and Major District Roads (MDR) |
| <i>Tertiary System</i> | Rural Roads – Other District Roads (ODR) and Village Roads (VR) |

Source: Ministry of Rural Development (2001) Pradhan Mantri Gram Sadak Yojana: Manual for preparation of district rural roads plan, Government of India

4.2.1 Public Works Department (PWD) and rural roads

At the district level, PWD has responsibility for construction, rehabilitation and maintenance of the primary and secondary road system though there are different sources of funds. There is an Engineer in Chief in overall charge of the PWD at the MP State level. Under him the state is divided into 5 zones with a Chief Engineer heading the PWD in each zone. The zones are divided into Divisions. Jabalpur district is covered by two of the Divisions in the Central Zone with each of the divisions headed by an Executive Engineer. Within Jabalpur district, there are 7 Sub-divisions and sectional offices.

Three departments within the PWD are (a) buildings and roads; (b) culverts and bridges, and (c) national roads. Clearly, responsibility for the State Highways (SH) and Major District Roads (MDRs) falls on the first department. Table 3 shows the lengths of different types of roads in Jabalpur according to the PWD Central Zone office. There are 529 km of MDRs in Jabalpur, most of them either bituminous or WBM. The PWD Central Zone office did not have a road condition inventory though it was acknowledged that a large portion of the district road network was not in a good state. While contact was made with the PWD Divisional Offices within the available time it was not possible to establish whether these offices had more detailed road condition information.

Table 4 Length of roads (kms) in Jabalpur District (MP): By classification and surface type

| | <i>Bitumen</i> | <i>Water based macadam (WBM)</i> | <i>Fair weather</i> | <i>Total</i> |
|-----------------------------|----------------|----------------------------------|---------------------|--------------|
| <i>National Highways</i> | 161.0 | | | 161.0 |
| <i>State Highways</i> | 134.2 | 0.9 | | 135.1 |
| <i>Major District Roads</i> | 281.3 | 215.1 | 33.0 | 529.4 |
| <i>Village Roads</i> | 169.9 | 518.8 | 98.0 | 786.7 |
| <i>Total</i> | 746.4 | 734.8 | 131.0 | 1612.2 |

Source: PWD Central Zone Office

The information in table 4 is not entirely consistent with other data on road lengths in the district. For example, according to MP road statistics, the road density in the district in 1999

was estimated to be 22.36 km per km², implying a total road length of 1265 km. According to the same source, the total length of black topped and WBM roads in the district is 1136.1 km as opposed to the 1481.2 km in the PWD data. On both estimates, the road density in the district is well below average for MP and India. However, the road statistics do not appear to include all rural roads and tracks connecting villages. A survey undertaken for the PMGSY shows that the total number of ODRs and VRs in the district is about 2,600 km of which about 1,000 km connect villages with population above 500 (see table 6 in section 4.2.6).

Of the expenditure on all major works undertaken by the PWD, about 90 per cent is estimated to be on construction, strengthening or major maintenance of roads, all done through contractors. During the mission, a field visit to a road currently being constructed was undertaken. Operational and technical details collected during the field visit, including the combination of labour and capital are set out in section 5.3 below.

One of the main sources of funds for road construction is the GOI Central Road Fund (CRF) from which funds are allocated to the states. One road is currently being constructed in Jabalpur District from CRF funds with the cost of Rs 200 lakhs (about US\$ 420,000). However, there was no allocation for Jabalpur from Central Government funds in the past 5 years or so. Another source of funds for investment in infrastructure of agricultural and rural importance is the National Bank for Agriculture and Rural Development (NABARD) which provides loans at concessionary rates determined by GOI. Currently, work financed from a NABARD loan is in progress on 5 rural roads with a total length of 50 km (loan for the financial year April 2001 to March 2002). The total cost is Rp 277 lakh (US\$580,000) of which Rp 120 lakh (about US\$250,000) has been spent. All of these are village roads being upgraded to a bitumen (BT) surface. With the new grant funding from PMGSY, the use of NABARD funding for rural roads is likely to be less prominent in the future. Another source is Mandi Funds obtained from taxes on agricultural production and devoted to development of the agricultural sector. There were no Mandi Fund road projects in Jabalpur at the time of the mission.

The PWD is also responsible for maintenance on national, state and major district roads. According to the established system, maintenance consists of:

- (a) routine maintenance;
- (b) special repairs and renewals where necessary;
- (c) strengthening and widening of roads where necessary, and
- (d) widening of bridges and culverts.

The maintenance budget for Central Zone is Rp 350 lakh (about US\$730,000). This is insufficient for all the maintenance activities set out above as a large proportion of the budget goes into wages and salaries. It appears that Rp 246 lakh (about US\$515,000) or 70 per cent of the maintenance budget is spent on wages, though an estimate of 85 to 90 per cent of the maintenance budget going into wages and salaries (leaving very little available for maintenance) was also mentioned. In principle, routine maintenance is by force account labour. As a result of shortage of funds, the only type of maintenance which is being carried out is routine maintenance. However, funds are insufficient even for routine maintenance. Further, there has been a freeze on recruiting permanent workers for the last 15 years or so. Therefore, the workers are getting older and those retiring are not being replaced. The high proportion of labour costs in routine maintenance indicates a labour-intensive approach to routine maintenance.

In summary, a substantial proportion (over 70 per cent) of the regular allocation of funds for maintenance is spent on PWD staff costs with an inadequate amount left over for maintenance activities. There are a number of sources of funds for road construction and rehabilitation from which the district could make application for specific projects through the PWD Central Zone. The identification of such projects of importance for a district is through the jila (district) panchayat and the administration which is primarily responsible for development in the district. A major new initiative on rural roads, PMGSY, is outside the PWD and does not include MDRs.

4.2.2 DRDA, employment generation and poverty alleviation schemes and rural roads

DRDA plays an important part in the implementation of small rural roads and other infrastructure projects as well as other development initiatives. It works in the overall context of the district administrative procedures and local democracy. It is an agency of the state level Department of Rural Development for implementing rural development, employment generation and poverty alleviation projects. The corresponding Central Government ministry is the Ministry of Rural Development. At the district level, the Development Collector is in overall charge of the DRDA.

DRDA channels funds from a number of rural infrastructure programmes and schemes financed by GOI and MP State Government. In addition, it may also be a conduit for aid from NGOs and external agencies. At present only one external agency, UNICEF, is providing aid through the DRDA for rural works, though this is for water resource projects and not roads. Currently, the main sources of funds for rural infrastructure works with rural roads components channelled through the DRDA are (a) EAS and JGSY (now restructured as parts of SGRY) and (b) MPs' and MLAs' funds. These are briefly described below.

4.2.3 EAS (Employment Assurance Scheme), JGSY (Jawahar Gram Samrudhi Yojana) and Sampurn Gram Rojgar Yojana (SGRY)

The aim of the Employment Assurance Scheme (restructured in April 1999) is to provide a given amount of paid employment for the poorest members of the rural population. The primary objective is employment generation and infrastructure development (roads and other works such as water tanks, small irrigation schemes, schools and other community buildings) is the secondary objective. Expenditure on roads is thought to be the largest component but during the mission, it was not possible to get a breakdown of expenditure by types of infrastructure.

The funds are split 70:30 between development blocks and the district. For funds allocated through development blocks, project proposals from the gram sabahs and panchayats are considered by the janpad panchayats. At the jila (district) level, DRDA is the implementing agency but decisions about project selection are taken by the jila panchayat. In selecting projects for schemes aimed at poverty alleviation, the proportion BPL population (i.e. below the poverty line) is an important consideration.

The difference between EAS and JGSY is that in the latter, the whole allocation is distributed to the gram panchayats according to a formula based on the total population and the size of the population below the poverty line. Under both the schemes, 75% of the contribution is from GOI and 25% from MP State. Project proposals are generated through a bottom-up approach based on local democracy. All villagers have a right to participate in this process. The proposals are generated at gram sabahs (village meetings) convened by the sarpanch, the democratically elected leader of the gram panchayat. These meetings must have a quorum of 10% of the adult population of the village.

From the financial year 2001-2, EAS and JGSY are being brought together as two streams under the SGRY. As table 5 shows, the allocations under the two schemes have been increased substantially in the current year. To enable this increase, surpluses of grains built up by the Food Corporation of India (FCI) are being released to supplement cash payments. The payment to project workers is Rs 50 per day of which half the payment is in kind (food grains). However, the project identification and selection processes for the two schemes will remain the same.

Table 5 Allocations under EAS and JGSY, 2001-2

| <i>Allocations</i> | <i>EAS (lakh Rp)</i> | <i>EAS (US\$)</i> | <i>JGSY (lakh Rp)</i> | <i>JGSY (US\$)</i> |
|--------------------|----------------------|-------------------|-----------------------|--------------------|
| Original (cash) | 249.36 | 521,674 | 356.19 | 745,167 |
| New (cash) | 110.43 | 231,025 | 48.69 | 101,862 |
| New (in kind) | 359.79 | 752,699 | 405.84 | 849,038 |
| Total | 719.58 | 1,505,397 | 810.72 | 1,696,067 |

Source: DRDA, Jabalpur District

Once a project is approved, if it is a local village project of below Rs 3 lakh (about US\$6,400), the materials are procured and supplied by the DRDA but funds (from EAS or JGSY) for the labour component of the project are provided to the relevant panchayat committee which manages the project. Where necessary, technical advice and assistance are provided by RES divisional and block level engineers and sub-engineers. Projects costing more than Rs 3 lakh (about US\$6,400) are implemented by RES. The upper limit of expenditure on these projects is Rs 7 lakh (about US\$15,000). However employment assurance and poverty alleviation projects are undertaken by direct labour only (i.e. contractors are not permitted to implement these projects). The criteria of ensuring a 60:40 split between labour and material costs is still adhered to.

On both the schemes, before their restructuring under SGRY, a minimum of 60 per cent of expenditure on each project had to be for labour, the remainder for materials (which include materials required for construction and tools). The equipment content is kept outside these restrictions. However, in general, the equipment content is for hauling of material and compaction and for projects implemented by the panchayats, the requirement is minimal. The RES does not have its own equipment but hires it either from the PWD or from private hirers. The minimum 60 per cent labour component requirement on each project has been relaxed as a part of the restructuring.

According to table 5, the total spending on the EAS and SGRY schemes, including the cash and kind components, is Rp 153,030,000 (about US\$3.2 million). If 60 per cent of this

expenditure is on labour (though this may be an overestimate) with the wage rate of Rp 50 per day, the programmes would create 1,836,360 person-days of employment, equivalent to 10,020 person years assuming 180 person-days of work in an year. This is about 2.2 per cent of the rural labour force and about 5.2 per cent of the labour force from households below the poverty line (based on the total district population of 2.6 million of which about 50 per cent is rural, the labour force being about 35 per cent of the population and 42 per cent of the workers coming from households below the poverty line). Employment generated as percentages of the rural labour force and workers below the poverty line are broadly in line with those at the national level (see section 3 above) and confirms the contribution of these schemes as providers of an additional local employment opportunity for the poorer sections of the rural population.

Maintenance of the infrastructure is the responsibility of the village communities. JGSY and EAS funds provided directly to the village authorities are assumed to include 15 per cent for maintenance of the constructed infrastructure. According to DRDA officials, in practice the 15 per cent allocation is not spent on maintenance but on new projects. In watershed management projects, the maintenance allocation and maintenance work better.

4.2.4 MPs' and MLAs' funds

Members of Parliament in New Delhi (MPs) and Members of the Madhya Pradesh Legislative Assembly (MLAs) have allocations to be spent on projects in their constituencies. MPs currently have an allocation of Rs 2 crore (US\$425,532) each while MLAs have an allocation of Rs 40 lakh (US\$85,106). Jabalpur district is represented by one MP whose constituency also includes some rural areas outside the district. In all there are 8 MLAs in Jabalpur district representing different constituencies (4 urban and 4 rural). The MPs and MLAs put forward proposals on the spending of their funds to the Collector's office. The approval of projects is ultimately by the jila (district) panchayat.

The total spending from MPs' and MLAs' funds on rural projects is approximately Rp 2.6 crore (about US\$540,000), assuming that half the MP's funds are spent on rural projects in addition to the four rural MLAs' funds. This is a substantial addition (about 17 per cent) to the total EAS and JGSY spending. Works from these funds are undertaken by contractors through RES, PWD or Irrigation Department depending on the nature and size of works.

4.2.5 RES and rural roads

RES is a technical service within the Department of Rural Development. RES in Jabalpur is headed by the Executive Engineer with the other technical staff being 3 sub-divisional engineers and about 30 sub-engineers in the field. RES directly undertakes rural works under the EAS and provides technical support and supervision of such work undertaken by the gram panchayats under the EAS and the JGSY. Under the EAS, works costing up to Rp 3 lakh (about US\$6,300) are undertaken by the gram panchayat while works costing more than this amount are implemented by the RES. The rural works include small tanks and dams, culverts, roads within villages and civic buildings. In addition, RES also undertakes projects from MPs' and MLAs' funds as noted above. These are typically short concrete roads in urban as well as rural areas. RES was not undertaking any rural projects at the time of the mission.

4.2.6 PMGSY and rural roads

PMGSY is a major programme initiated in December 2000 to improve road access for the rural population. The objective is to connect all villages / habitations with population in excess of 1000 persons by all-weather roads by the end of 2003 and villages / habitations with more than 500 persons by the year 2007 (i.e. by the end of the 10th Plan Period). All districts are required to produce a master plan, District Rural Roads Plan, as a basis for planning, implementation and monitoring. Within the overall guidelines, the State authorities have some discretion. For example, in MP, roads which already have a BT surface which is in poor condition are to be upgraded first, followed by those with WBM surface and then gravel or earth roads.

Because of the objective of enhancing village connectivity, the focus of PMGSY is on ODRs and VRs, based on the assumption that there is adequate funding for higher category roads. This may be the case for National and State Highways which are beyond the scope of this assignment. However, evidence on MDRs indicates that these roads also need attention. In implementing PMGSY, all-weather has been interpreted as a BT surface road. This has implications for the cost of the programme and funding.

A new Rural Roads Development Authority has been set up within the MP State Department of Rural Development to implement PMGSY in the State. The manner in which the new authority is organised is novel. The authority manages the process of tendering and granting road construction and rehabilitation contracts in large parcels. The process of supervision has been contracted out to private consulting companies. The rationale behind this structure is that the local implementing agencies do not have the technical and managerial capability to manage a project of this magnitude. It has also been argued that the typically small local contractors would not have the capability to deal with large contracts though this objection could be overcome by packaging contracts into smaller parcels. There was also concern that waste and misappropriation are difficult to monitor and control with large numbers of local implementing agencies and contractors.

Another problem that the PMGSY structure is intended to deal with is the inadequate maintenance provision for rural roads under the present arrangements. Under PMGSY, contractors are responsible for maintenance for the first 5 years after road construction, after which responsibility for maintenance reverts to the implementing agencies. To ensure satisfactory maintenance during the 5 year period, 10 per cent of the contract payment will be held back until the end of the 5 years after construction. Upgrading to BT surfaced roads is also justified on the grounds that it would minimise maintenance requirements.

The Project Implementation Unit in Jabalpur is responsible for implementation in 3 districts (Jabalpur, Narsinhpur and Katni). It is responsible for planning, project selection and the tendering process under the supervision and guidance of the Rural Roads Development Authority. The Unit in Jabalpur is headed by the General Manager. The other technical staff are 2 Assistant Engineers and 4 Sub-engineers.

In Madhya Pradesh there are 51,000 villages of which 43,000 are not connected by BT surface roads. The cost of connecting villages / habitations with population in excess of 1000 persons for the whole of MP is Rp 6,000 crore (US\$1.26 billion). The total cost of securing

connectivity for all villages / habitations with population in excess of 500 persons in MP is estimated to be Rp 10,000 crore (US\$2.1 billion). The Jabalpur District Rural Roads Plan shows that there are 1415 villages in the district. Of these 519 (or 37%) have populations in excess of 500 persons. Of the villages with populations above 500 persons, 134 villages (or 25.8 per cent) are connected by bitumen roads.

Table 6 Length of roads connecting villages in Jabalpur

| Village Population | Villages connected by BT roads | | Villages not connected by BT roads | |
|--|--------------------------------|------------------|------------------------------------|------------------|
| | Number | Road length (km) | Number | Road length (km) |
| Jabalpur District | | | | |
| Less than 500 | 55 | 44.9 | 777 | 1577.35 |
| Between 500 and 1000 | 62 | 63.6 | 311 | 733.15 |
| More than 1000 | 60 | 34.75 | 108 | 271.2 |
| | | | | |
| Lengths of all roads | 177 | 143.25 | 1196 | 2581.7 |
| Road lengths for villages with population above 500 | 122 | 98.35 | 419 | 1004.35 |

Source: MPRRA Project Implementation Unit, Jabalpur.

GOI's commitment to PMGSY is demonstrated by its allocation of a proportion of revenue from an additional tax on diesel to the programme. For the national programme, GOI requires to generate Rp 10,000 crore (about US\$2 billion) for the first phase. It appears that only Rp 5,000 crore (about US\$1 billion) have been generated and about half of this revenue is being allocated to PMGSY at the national level. Funding for MP has also fallen short of the requirement. GOI has released about 40 per cent of funds required for the programme in MP. GOI is seeking external support for the programme. An alternative to seeking external funding is to reassess the overall strategy and to reorient it towards a more labour-based lower cost approach.

During Phase I of the programme (2000 -2001), the size of contract packets is in the range Rp 3 to 5 crore (US\$630,000 to US\$1,000,000). Contracts include construction or rehabilitation and maintenance of the improved roads for the first five years after which responsibility for maintenance reverts to the blocks and villages. This means that class A4 and A5 contractors according to MP State criteria or contractors of equivalent class from other states are qualified to undertake these projects (see section 5.2 for more details on contractor classification). The qualifying criteria effectively exclude contractors based in Jabalpur District.

Some of the larger contractors have asked for larger sized contract packets and removal of the five year maintenance requirement. Partly in response to this, during the next phase (2001 – 2002), the contract packets will be in the Rp 5 to 10 crore range (US\$10 to US\$20 million

range) but the maintenance requirement will remain. This will effectively exclude class A4 contractors.

The shift away from the use of local contractors is a reaction to the poor quality of rural public works under the present programmes and agencies. Under the PMGSY, to ensure quality, specifications have been set in consultation with the Ministry of Transport and the Indian Road Congress. The intention is to adhere to them rigidly under rigorous supervision by private consultants during implementation.

A number of reasonable arguments have been put forward in support of the overall strategy of the PMGSY to improve roads to BT surface level through large contracts. In summary, these are:

- (a) concern with the quality of rural infrastructure works in the past and on the current employment generation programmes;
- (b) lack of technical and management capacity of small local contractors and in the implementing agencies, and
lack of adequate maintenance provision and arrangements for implementing it.

While GOI has made a serious resource commitment to PMGSY, the funding is likely to fall short because of the high cost of the programme because of the decision to upgrade all roads to BT surface irrespective of the cost-benefit considerations. The high cost of the programme is because of the focus on the type of road surface rather than the condition of roads. For roads with low traffic volumes, for example fewer than about 300 motorised vehicles per day, a murrum or a WBM road could be justified on cost-benefit considerations but a BT road may not be. The scheme documentation does provide some scope for flexibility in the choice of road surface:

“The Rural Roads to be taken up under the Pradhan Mantri Gram Sadak Yojana will, by and large, be all-weather surface roads, i.e. roads with a bituminous or cement concrete surfacing, or WBM with surface dressing. However, the choice of surface of Rural Roads (Cement concrete, black topped, WBM with surface dressing, gravel) would be determined inter alia, by factors like traffic density, soil type and rainfall. Separate guidelines will be issued regarding the design and specifications of the Rural Roads.”

(Source: Ministry of Rural Development (2001) Pradhan Mantri Gram Sadak Yojana: Manual for preparation of district rural roads plan, Government of India.)

4.2.7 Main lessons on organisational structure and financing for rural roads

The above description of the agencies and programmes involved in the upgrading and maintenance of rural roads identifies a number of issues to be addressed by a strategy for rural roads:

- (a) Until the hypothecation of a part of diesel tax by GOI to ensure substantial funding (apparently secured until 2007, i.e. the end of the 10th Five Year Plan) for the improvement of rural roads under PMGSY, there was no consistent funding for rural roads at the district level with the exception of the employment generation and poverty alleviation rural infrastructure schemes. The primary objectives of these schemes are stated to be poverty alleviation and employment generation with

infrastructure development as a secondary objective. Under these schemes, improvement of the less important roads (ODRs and VRs) has to compete with other small infrastructure works. There is no dedicated funding for the more important rural roads (MDRs).

- (b) There is no single agency for rural roads construction, upgrading and maintenance at the district level (this is an issue for MP State and not only for the district) and as a result, no coordinated policy on the allocation of funds for different levels of roads (i.e. MDRs, ODRs and VRs). Such an agency would also have to look at the appropriate level of upgrading (including type of road surface) and maintenance arrangements.
- (c) The Rural Roads Authority set up for the construction / rehabilitation of rural roads under PMGSY could form a basis for such a planning, coordinating and implementing agency. However, its present terms of reference are too limited for such a role.
- (d) More precisely, the limitations of the Rural Roads Authority as a strategic rural roads agency are that:
 - it is concerned with ODRs and VRs only and not MDRs;
 - its remit is to upgrade all selected roads to a specified BT standard irrespective of traffic volumes and accessibility requirements, and
 - for ODRs and VRs, the Authority is required to develop district roads plans based on an inventory but because of its remit of ensuring connectivity by BT roads for villages above a certain size, the inventory does not include additional information essential for planning on the present road condition, the accessibility it affords and traffic volumes.
- (e) The PMGSY focus on ODRs and VRs also raises the issue of determining which roads are to be rehabilitated and maintained under SGRY and the role of RES in rural roads rehabilitation.
- (f) There is inadequate provision for maintenance for all types of rural roads. For the MDRs, PWD does not have the resources to implement planned maintenance and for ODRs and VRs, the blocks and villages are responsible for maintenance but there are no resources for maintenance.
- (g) There is also scope for improvement of management information. A general impression obtained during the mission was that while there are project and programme reporting systems in place and these have been computerised to some extent, the best use is not being made of computers to produce information useful for planning and management.

4.3 Urban authorities, District Urban Development Authority (DUDA) and infrastructure works

Jabalpur District has 10 urban areas with proportionally a high urban population (about 50 per cent) in comparison with MP State and India. Jabalpur City is by far the largest urban area and the only Municipal Corporation in the district under the Municipal Act. The municipality operates an annual budget system with the current annual budget of Rp 67 crore (US\$14 million). The sources of revenue are various district and municipal taxes on property, sanitation and vehicles and MP State contributions. About 65 per cent of the expenditure is on the establishment (wages and salaries of municipal workers and officials as well as institutions such as schools and primary health centres run by the Municipality). Most of the

remaining is spent on development and welfare schemes which include upgrading, repair and maintenance of roads, drainage, civic buildings and slum clearance which are done through contractors.

According to the Jabalpur Municipality budget for the year 2000-2001, the total development work is about Rp 20.6 crore and public works department expenditure (including repairs and maintenance) amounts to Rp 2.2 crore. The total is Rp 22.8 crore (about US\$4.75 million and 34 per cent of the total budget). About a quarter of this expenditure during 2000-2001 was on road improvement, repairs and maintenance. Much of the rest was on repair and maintenance of civic buildings and amenities. Information on contractor operations on roads indicates that the work makes use of casual labour supported by light equipment. In addition, other civil works also make use of casual labour.

The municipality is also the nodal institution for the implementation of State and Central Government urban development and welfare schemes. The District Urban Development Agency (DUDA) has been set up as an intermediary organisation for the disbursement of funds from these schemes to Jabalpur Municipality and the other urban centres in the district because, by law, funding from such schemes cannot be made directly available to the urban authorities. DUDA obtains funds for five schemes for promoting micro-businesses, generating employment through public works including slum clearance, encouraging savings and providing low cost life insurance.

Two of the programmes administered by DUDA have public works elements. These are the Urban Workers Employment Programme (UWEP) and the NSDP (National Slum Development Programme) under the Swaran Jayanti Swarojgari Yojana (SJSRY). According to the information provided, the expenditure and employment effects of UWEP were small (annual expenditure of Rp 2 lakh (US\$ 4,200) and employment creation of 1187 person days) during the financial year 2000-2001.

Allocation from the National Slum Development Programme (NSDP) is more substantial, in excess of Rp 100 lakh (about US\$209,000) in each of the financial years 2000-2001 and 2001-2002. The types of expenditure include basic amenities such as water supply, lighting and sanitation as well as physical infrastructure such as roads, drainage and sewerage. Out of an urban population of about 1.3 million in the district according to the 2001 census, 668,000 people (over 50 per cent) are estimated to be living in slums. There is therefore a large need for slum improvement.

It was not possible to obtain information on the budgets of the urban authorities in the district other than Jabalpur Municipality. However, comparison of the Jabalpur Municipality budget with allocations from UWEP and NSDP for all the urban areas in the district shows that the latter two are relatively small, about 4.5 per cent of the total Municipality development expenditure of Rp 22.8 crore and about 18 per cent of the expenditure on road improvement, repairs and maintenance.

5. OPERATIONAL AND TECHNICAL ASPECTS

5.1 Introduction

Implementation through contractors is the accepted mode of operations for infrastructure construction and rehabilitation. The exceptions are works under EAS and JGSY which are by direct labour (see section 4.2.3 above). The operational and technical aspects described in this section are therefore based on (a) contractor operations on roads on which information was collected during the mission through field visits and interviews and (b) RES technical specifications and operations for road projects. Information on operational and technical aspects of small works undertaken by village panchyats under EAS and JGSY was not available.

This section starts with a description of the classification of contractors in MP State and availability of different types of contractors in Jabalpur District. This is followed by an account of project implementation and especially the combination of labour and capital in road construction, labour recruitment, supervision and payment methods and availability of tools and equipment.

5.2 Contractor classification and operations

Table 7 sets out classification of civil works contractors in MP State. Classes C and B are small contractors while classes A1 and A2 broadly represent medium sized contractors. Evidently, there are numerous small and medium size contractors in the district. They undertake minor road drainage and irrigation works as well as building construction and repair for the PWD, RES, urban authorities and other clients. There are a number of larger contractors in MP State and contractors from other nearby states also compete for large contracts within the state.

Requirements for progression by contractors to higher classes are also clearly set out. However the lack of contractors in Classes A3 or higher in the district suggest that specified requirements for progression, ownership of equipment and qualifications, pose a significant barrier to progression beyond Classes A1 or A2. Another explanation is that there are few large contracts on offer in the district.

With respect to developing a labour-based approach, it is an advantage that small and medium sized contractors are not required to own equipment. Description of their operations below indicates that any light equipment they require can be hired at reasonable rates. Larger contractors geared up to undertake larger highway and other civil construction projects, are required to own a complement of construction equipment such as (loaders, rollers, light and heavy excavators and dump trucks). Although large contractors are required to own heavy equipment, evidence from field visits and discussions with contractors, RES and the MP Rural Road Development Authority officials indicates that because of the economics of labour and equipment operation, even large contractors use labour in a number of activities.

Table 7 Classification of contractors and estimated numbers in Jabalpur

| <i>Class</i> | <i>Upper limit on contract value</i> | <i>Qualification</i> | <i>Estimated number in Jabalpur District</i> |
|--------------|--------------------------------------|---|--|
| C | Rp 2 lakh (US\$4,184) | Site experience | 80 to 100 according to PWD but according to contractors interviewed, much larger number, about 350, appear to be registered with Jabalpur municipality |
| B | Rp 4 lakh (US\$8,368) | Rp 4 lakh of contracts as Class C contractor within the last 3 years | 25 to 30 (according to PWD) |
| A1 | Rp 10 lakh (US\$20,921) | Rp 10 lakh of contracts as Class B contractor within the last 3 years and a member of staff with a civil engineering qualification | 25 to 30 (according to PWD) |
| A2 | Rp 50 lakh (US\$104,603) | Rp 25 lakh of contracts as Class A1 contractor within the last 3 years, evidence of solvency and income tax clearance certificate. | About 3 in Jabalpur but more in Central Zone (according to PWD) |
| A3 | Rp 1 crore (US\$209,205) | Specified turnover and experience in previous years, ownership of equipment and employment of qualified staff, evidence of solvency and income tax clearance certificate. | None in Jabalpur. Contractors from Bhopal or other large cities within MP and outside. |
| A4 | Rp 4 crore (US\$836,820) | Specified turnover and experience in previous years, ownership of equipment and employment of qualified staff, evidence of solvency and income tax clearance certificate. | None in Jabalpur. Contractors from Bhopal or other large cities within MP and outside. |
| A5 | Unlimited | Specified turnover and experience in previous years, ownership of equipment and employment of qualified staff, evidence of solvency and income tax clearance certificate. | None in Jabalpur. Contractors from Bhopal or other large cities within MP and outside. |

Source: PWD Central Zone Office supplemented by RES and interviews with contractors.

For a labour-based approach for rural roads to be implemented by contractors who either do not own any equipment or own appropriate light equipment for labour-based activities, it may be necessary to adjust upwards the maximum contract value for Class A2 contractors or to specify a special category of rural roads contractors who can undertake larger rural contracts without ownership of heavy construction equipment.

There are well set out procedures for submitting tenders for contracts by sealed bids for large and small contracts. Detailed technical specifications and drawings are set out, especially for larger projects for the PWD, RES and PMGSY. The road construction specifications are typically very detailed in the types and quality of materials to be used and the thickness of layers. These detailed specifications are set out to ensure the quality of the road. However, they also prevent flexibility, for example in using locally available materials in larger quantities for rural roads with moderate traffic levels to cut costs. Such flexibility, alongside with some changes in design specifications (e.g. u-shaped instead of v-shaped ditches) would be required for a labour-based approach.

There appear to be more than a sufficient number of contractors currently engaged in civil construction activities. Their modes of operations are described below to assess their capability to undertake labour-based projects and to identify any measures required to enhance their capabilities.

5.3 Implementation

The description of implementation in this section, and of related aspects such as tools and equipment used and their availability, labour recruitment and supervision and payment methods, is based on (a) field visits to one large rural road project being undertaken by a Class 5 contractor for the PWD, (b) information from RES documents on construction operations and costs for rural roads (c) 3 small scale contracts being undertaken for RES and the Municipality within Jabalpur city, and (d) additional interviews with 5 contractors currently or recently engaged in projects for Jabalpur Municipality and RES. At the time of the mission, the RES was not engaged in any rural road projects.

5.3.1 Construction / rehabilitation activities on a major district road (MDR) by a contractor for PWD

The Sihora – Majholi – Katangi Road (32.8 km) provides a link between National Highway 7 between Jabalpur and Katri (another district centre) and the Jabalpur – Sagar – Damoh highway. It is being rehabilitated and upgraded to a 5.5 metre wide bitumen road. The total contract is Rs 10 crore (US\$2.1 million) for the 32.3 km road (i.e. about Rp 3,050,000 or US\$ 64,000 per km).

The phases of the works on a typical road section are:

- removal of existing deteriorated surface (on the existing 4.5m wide road)
- excavation of road surface and putting down sub-base and base, typically for half the section to enable traffic to get through during construction (labour-based with hauling of material by trucks)
- compaction of base and spreading of bitumen layers (motorised vibrating roller, water bowser, bitumen spreader)

In addition, there were two quarries for base and sub-base material. At one of the quarries, initially, stone-crushing was by hand and excavation of material was also being done manually. However, because of safety issues and the need for faster operations, a mechanical stone crusher had been installed and two excavators were being used. Hauling material was

by dump trucks. At the second quarry, stone crushing was being done by labour. About 350 workers were employed in this activity.

At the time of the field visit, work was going on over a 25 km stretch with 500 casual workers employed through labour contractors. The estimated split between the cost of labour and materials was 40:60. The material cost includes construction materials and fuel and other consumables related to equipment and project operations. The contractor operated owned equipment and the project manager's cost estimates did not include depreciation costs. The company's staff costs were also not included in calculating the split between the labour and material costs.

According to the project manager, the overall aim was to use labour wherever appropriate because of the low cost of labour but labour has been replaced by equipment in some operations, for example excavation of base and sub-base material in one of the quarries because of the safety problem of excavation at a quarry with a high bank and the large number of workers required to keep pace with the requirement for material. Apart from one of the quarries, the main activities in which labour was being used were:

- excavation of "soft" material on the road site;
- hauling of base and sub-base materials on site, and
- spreading and arranging of materials on site.

5.3.2 Short urban road projects by small / medium sized contractors

The urban projects were visited as a part of the assessment of the employment generation potential of urban works. Ideally, small rural projects should also have been examined. However, it was not possible to look at such projects partly because of the difficulty of organising a visit to projects being implemented by village panchyats within the time available and partly because RES was not implementing any rural projects at the time of the mission. Table 8 summarises the operational and technical information from the field visits.

It is not possible to draw definite general conclusions applicable to longer labour-based roads from data on small concrete roads. However, the operational information provides some useful general indications. On all three projects, labour was hired through petty labour contractors who were responsible for supervising and paying labour. The labour contractors were paid for tasks and appeared to be paying workers on a piece rate basis. The average wage rate was estimated to be Rp 70 per day. The main tools used by workers on site were pick axes, hammers, pans for head loading of material including concrete, hoes and shovels. They were supplied by the labour contractor. The tools were of local manufacture, some of them made in Jabalpur and all of them had been purchased in Jabalpur.

In addition to the field visits, brief interviews were held with four municipal contractors and one RES contractor. The municipal contractors had recently undertaken small contracts ranging in value from Rp 2 lakh (US\$4,200) to Rp 10 lakh (US\$21,000) to construct short concrete roads and repair drainage. They had also used concrete mixers and vibrating rollers as the main pieces of equipment and worked with teams of about 40 unskilled workers. The contract values averaged about Rp 50,000 (about US\$1000).

Table 8 Summary information from three short urban projects

| | Road 1 (RES) | Road 2 (RES) | Road 3 (Municipality) |
|---------------------------------|---|---|--|
| Length (km) | .095 | .25 | .435 |
| Technical specifications | 2.5m wide concrete road 40 mm metal and murrum base 14mm cement concrete with 20mm metal | 2.5m wide concrete road 40 mm metal and murrum base 14mm cement concrete with 20mm metal | 5m wide concrete road 40 mm metal and murrum base 14mm cement concrete with 20mm metal |
| Labour | 40 to 60 workers employed for a period of 4 to 5 days at an average rate of Rp 70 per day | 5 to 6 workers employed for a period of 3 days for clearing and preparation prior to concreting at an average wage rate of Rp 70 per day 50 to 60 workers employed for a period of 5 days for carrying concrete to the road in metal pans at an average wage rate of Rp 70 per day | 40 to 60 workers employed for a period of 20 days for carrying concrete to the road in metal pans at an average wage rate of Rp 70 per day |
| Equipment | Concrete mixer and vibrating roller (both hired at the rate of Rp 500 per day for 6 days for each piece of equipment plus operator for each piece of equipment at Rp 100 per day) | Concrete mixer and vibrating roller (both hired at the rate of Rp 500 per day for 6 days for each piece of equipment plus operator for each piece of equipment at Rp 100 per day) | Concrete mixer (hired) and vibrating roller (owned by contractor) |
| Contract price | Rp 54,000 (US\$1130) | Rp 137,000 (US\$2866) | Rp 560,000 (US\$11,700) |
| Equivalent cost per km | Rp 568,000 (US\$11900) | Rp 548,000 (US\$11500) | Rp 1,287,000 (US\$26,900) |

According to the municipal contractors interviewed, there are a large number of small to medium-sized contractors in the district. About 350 contractors were registered with the Municipality. The contractors interviewed stated that they did not have the capability to undertake slum clearance and development contracts because they required equipment such excavators and dump trucks.

The RES contractor interviewed had recently completed a 3 km rural WBM road. The contractor used a tractor drawn trailer for hauling murrum, road roller for compaction and

a water tanker. Labour was used for stone breaking as well as for earth works and laying down the base. Labour was recruited directly by the contractor (i.e. not through petty contractor) who also supplied the hand tools. The contractor estimated that 22 per cent of the total cost was labour.

5.3.3 Rural WBM and murrum road construction by RES

For rural roads (ODRs and VRs), RES has a standard WBM specification with a life of 10 to 15 years. The formation width (full width of road including drains and embankments) of this specification is 10 metres with a roadway (road width including shoulders) of 7.5 metres and carriageway (available for traffic) of 3.75 metres.

The work is done typically on an existing deteriorated road or path and includes:

- (a) initial clearing and grubbing;
- (b) earthworks for formation;
- (c) excavate carriageway width to depth of 150 mm and fill with oversize metal to level
- (d) hauling of murrum, metal and water by tractor and trailer (2 cu. m. capacity) or trucks;
- (e) spread layers of murrum (80 mm) and “oversize metal” (100 mm, hand packed);
- (f) compaction of “oversize metal” by roller with murrum and water, and
- (g) laying down and compaction of 80 mm thick WBM coat (with 40 mm metal) in wet season.

All activities, apart from hauling of materials and compaction, are done by labour and the 60:40 breakdown between labour and materials costs required for the EAS and JGSY is generally complied with. The RES does not have its own equipment but hires it from private companies or the PWD. RES also has a specification for murrum roads based on the WBM specification. It substitutes thicker layers of murrum for metal and is lower cost. The murrum road specification is used on short sections of roads, typically approach roads to an improved road. According to RES, its work is of better quality than contractors’ work. RES does not have a budget for the maintenance of the ODRs and VRs it constructs. Blocks and villages are responsible for maintenance.

Based on information provided by the RES, section 6.2 provides (a) cost estimates for WBM and murrum roads and (b) approximate breakdown between labour and other costs.

5.4 Labour: Recruitment, supervision and payment

The PWD contractor on the Sihora – Majholi – Katangi road (MDR) did not recruit labour directly but used labour contractors to recruit the required number of workers. Recruitment took place at certain places in towns or larger villages which were known to employers and persons looking for casual employment. Labour contractors also went into villages to recruit workers. Supervision of the workers and their payment were also the responsibility of the labour contractors.

Typically, the contractor pays the labour contractor every two weeks according to the work completed. Payment by the labour contractor to the workers was based on a system between task rate and piece rate (referred to here as a “task plus” system). Daily payment was for the

completion of a specified task but workers could choose to undertake more than the specified daily task and get paid proportionally more. The advantage of a purely task rate system is that it is easier to supervise than piece rate work. A payment is made for a given amount of work completed to a satisfactory standard. A piece rate requires more effort in supervision and measurement of completed work and makes the payment system more complex. However, if labour contractors are responsible for payment, it can be assumed that they will use a system most advantageous for them. Issues which may require attention are that the tasks set are reasonable and the piece rate incentive does not put pressure on workers to exert themselves beyond their capabilities.

While the system of recruitment described above works well, there are sometimes complaints that contractors bring workers from outside the project locality and therefore do not employ local people. A labour-based project aimed at providing local employment may have to examine this issue and set a requirement of local recruitment. On the Sihora – Majholi – Katangi road, the contractor preferred to recruit locally through local labour contractors.

All the contractors on the small urban projects whose sites were visited or who were interviewed used petty labour contractors to recruit and manage workers. As for the large contractor on the Sihora – Majholi – Katangi road, the urban contractors' agreement with the labour contractors was to pay given amounts for specified tasks. The labour contractors also appeared to use a "task plus" system for paying workers.

There are a number of locations (the main one being "Labour Chowk") in Jabalpur where contractors recruit casual workers who may be from Jabalpur or from rural areas. One of the workers interviewed on a site was from a tribal area about 100 km away. This was the first time he had come to Jabalpur to look for a job. He had to wait for two days before he got the job and intended to go back to his home when the job was finished.

Because of the specific requirements of EAS and JGRY, the recruitment procedure on projects under these schemes undertaken by RES is different. Recruitment is through village officials. In line with the objectives of the schemes, officials are required to give priority to members of poorer households.

5.5 Tools and Equipment

India has a strong manufacturing sector and most tools and equipment are manufactured within the country. All the equipment used by the large PWD contractor on the Sihora – Majholi – Katangi Road (excavators, dump trucks, stone crusher, rollers, water bowsers, bitumen spreader) was owned by the contractor. According to the project manager, all the equipment owned by the company had been manufactured in India by Indian firms, though some of it would have included technology licensed from foreign firms and may also have included imported materials and components.

While Jabalpur is not an industrial city, there are a few small manufacturers of metal products and equipment such as concrete mixers. Depending on specifications, the cost of a small concrete mixer was between Rp 28,000 (US\$600) and Rp 55,000 (US\$1150). Most tools and equipment can be purchased or manufactured locally.

Small contractors and RES are able to hire light equipment such as rollers (vibrating or otherwise), concrete mixers and tractors and trailers readily from private companies at reasonable cost. The hire rate appeared to be in the range Rp 500 (about US\$10) to Rp 700 (about US\$15) including the services of an operator. Heavier construction equipment is less readily available in Jabalpur but this is not a problem for labour-based methods.

Supply of hand tools is the responsibility of labour contractors. It appears that some labour contractors provide tools while others ask the workers to bring their own. The tools used (typically, pick axes, hammers, pans for head loading of material including concrete, hoes and shovels) are available in local markets and have either been manufactured in MP State or within India. On casual observation, tools on sites appeared to be battered and in some cases patched up but serviceable.

Appropriate types and specifications of equipment and tools and their quality and durability affect the efficiency and costs of labour-based operations and therefore making an assessment of appropriate specifications and quality would be a component of a labour-based project. If private companies and labour contractors are responsible for supplying equipment and tools, a labour-based project would have to work with them initially to assess the equipment and tools currently in use and introduce new ones.

5.6 Maintenance Methods

As mentioned above, maintenance is limited to emergency works on rural roads because of resource limitations and inadequate institutional arrangements for maintenance. The PWD recognises the need for different types of routine and periodic maintenance activities (section 4.2.1) on the MDRs it is responsible for but resource limitations prevent a systematic maintenance programme. For ODRs and VRs, there is no provision for maintenance from public funds.

6. ROAD CONSTRUCTION AND REHABILITATION COSTS

6.1 Introduction

Information on the estimated costs of different types of roads, and the breakdown between labour and other costs where available, have been summarised in this section. The most detailed information was obtained for rural WBM and murrum roads from RES. Such roads also offer the greatest scope for the labour-based approach. For comparison, available estimates of rural bitumen roads (especially under PMGSY) and concrete urban roads have also been provided because the relative costs of different types of road surfaces have important implications for the labour-based approach.

6.2 RES cost estimates: WBM and murrum roads

Tables 9 and 10 show the estimated quantities and costs of typical WBM and murrum roads based on information provided by RES (see section 5.3.3 for description). The average costs per km are Rp 485000 (or US\$10150) for WBM and Rp 398000 (or US\$8300) for murrum roads. However, as the tables show, the estimated costs include quite high allowances for contingencies. The breakdown of costs is not sufficiently detailed to make a precise separation of labour, materials and equipment costs. For WBM, an approximate separation is obtained by assuming that in table 9, activities 1 to 4 (less the cost of one day of road roller operation), 10, 11 and 14 are mainly by labour, 5, 6 and 7 are mainly material costs and 8, 9, 12, 13, 15 and 16 are mainly equipment operation costs. On this basis, the ratio of labour to material costs is almost exactly 60:40 (this and the following calculations are based on the total cost before contingencies and road signs). Labour costs are just under 30 per cent of total costs and equipment costs are about 50 per cent of the total. The table shows that high equipment operation costs are mainly because of the cost of hauling materials.

For murrum, an approximate separation is obtained by assuming that in table 10, activities 1 to 4 and 7 are mainly by labour, 5 is mainly material costs and 6, 8, 9 and 10 are mainly equipment operation costs. On this basis, the ratio of labour to material costs is 74:26 and labour costs are 35 per cent of total costs and equipment costs are about 55 per cent of the total.

The estimates in this section provide indicative costs for broad comparisons. Costs on actual road sections may vary significantly depending on the terrain and soil conditions. The estimates do not include costs of culverts and bridges. The estimated proportions are very approximate and are likely to be underestimates of the labour component (for example in items 5, 6, 7 and 16 for WBM roads and items 5 and 8 for murrum roads). Overall, the RES methods described above are close to being labour-based. The labour-based approach would seek to reduce material and haulage costs by using more locally available material though this may not always be possible.

Table 9 RES WBM specification: quantities and costs per km (excluding culverts and bridges)

| <i>Specifications: Formation width: 10m, roadway including shoulders: 7.5m, carriageway width 3.75m wide road</i> | | | | | | | | | |
|---|--|---------------------------|----------------|-----------|------|----------|-----------|---------------|----------------------|
| | Activities | Length (m) | Breadth (m) | Depth (m) | Unit | Quantity | Rate (Rs) | Amount (Rs) | Comments |
| 1 | Clearing and grubbing | 1000 | 10 | | sq m | 10000.00 | 0.17 | 1700 | |
| 2 | Digging and levelling | 1000 | | | cu m | 3000.00 | 1.0412 | 3124 | Roller for levelling |
| 3 | Earth works I | 1000 | Total quantity | | cu m | 4072.50 | 20.35 | 82875 | |
| 4 | Earth works II | 1000 | Total quantity | | cu m | 675.00 | 20.05 | 13534 | |
| 5 | Collection of graded material I (90mm - 45mm) | 1000 | 3.75 | 0.1 | cu m | 375.00 | 64.6 | 24225 | |
| 6 | Collection of graded material I (63mm - 45mm) | 1000 | 3.75 | 0.075 | cu m | 281.25 | 89.45 | 25158 | |
| 7 | Collection of hard murrum | 1000 | Total quantity | | cu m | 1460.61 | 18.25 | 26656 | |
| 8 | Transportation of metal (haul distance 10km) | Quantity: (5) + (6) | | | cu m | 656.25 | 71.65 | 47020 | |
| 9 | Transportation of murrum (haul distance 5km) | Quantity: Same as item 7 | | | cu m | 1460.61 | 58.32 | 85183 | |
| 10 | Stacking and boxing - murrum or sand | Quantity: Same as item 9 | | | cu m | 1460.61 | 3.25 | 4747 | |
| 11 | Stacking and boxing - metal and shigle or gravel | Quantity: Same as item 8 | | | cu m | 656.25 | 6.3 | 4134 | |
| 12 | Compaction of murrum by roller | 1000 | Total quantity | | cu m | 1309.68 | 13.5 | 17681 | |
| 13 | Watering for murrum with haul distance of 100m | 1000 | Total quantity | | cu m | 1309.68 | 8.85 | 11591 | |
| 14 | Spreading and hand-packing of oversize metal for consolidation | 1000 | 3.75 | 0.1 | cu m | 375.00 | 15.1 | 5663 | |
| 15 | Compaction of oversize metal with spreading of murrum and necessray watering | Quantity: Same as item 14 | | | cu m | 375.00 | 49.7 | 18638 | |
| 16 | 80 mm thick WBM coat (in wet season) - compactriion with murrum and water | 1000 | 3.75 | 0.075 | cu m | 281.25 | 85 | 23906 | |
| | Total | | | | | | | 395834 | 8281 US\$ approx |
| | Contingencies @ 20% | | | | | | | 475000 | |
| | Road signs | | | | | | | 10000 | |
| | Total | | | | | | | 485000 | 10146 US\$ approx |

Table 10 RES murrum specification: quantities and costs per km (excluding culverts and bridges)

| <i>Specifications: Formation width: 10m, roadway including shoulders: 7.5m, carriageway width 3.75m wide road</i> | | | | | | | | | | |
|---|---|--------------------------|----------------|------|----------|-----------|-------------|---------------|----------------------|--------------|
| Activities | Length (m) | Breadth (m) | Depth (m) | Unit | Quantity | Rate (Rs) | Amount (Rs) | Comments | | |
| 1 | Clearing and grubbing | 1000 | 10 | | sq m | 10000 | 0.17 | 1700 | | |
| 2 | Digging and levelling | 1000 | | | cu m | 3000 | 1.0412 | 3124 | Roller for levelling | |
| 3 | Earth works I | 1000 | Total quantity | | cu m | 4072.50 | 20.35 | 82875 | | |
| 4 | Earth works II | 1000 | Total quantity | | cu m | 675.00 | 20.05 | 13534 | | |
| 5 | Collection of hard murrum | 1000 | Total quantity | | cu m | 2116.86 | 18.25 | 38633 | | |
| 6 | Transportation of murrum (haul distance 5km) | Quantity: Same as item 5 | | | cu m | 2116.86 | 58.32 | 123455 | | |
| 7 | Stacking and boxing - murrum or sand | Quantity: Same as item 6 | | | cu m | 2116.86 | 3.25 | 6880 | | |
| 8 | Spreading and compaction of murrum by roller | 1000 | Total quantity | | cu m | 1309.68 | 13.5 | 17681 | | |
| 9 | Watering for murrum with haul distance of 100m | 1000 | Total quantity | | cu m | 1309.68 | 8.85 | 11591 | | |
| 10 | 80 mm thick murrum coat - compaction with water | | | | | | | 23906 | | |
| Total | | | | | | | | 323378 | 6765 | US\$ approx. |
| Contingencies @ 20% | | | | | | | | 388054 | | |
| Road signs | | | | | | | | 10000 | | |
| Total | | | | | | | | 398054 | 8327 | US\$ approx |

6.3 PMGSY cost estimates and comparison with a lower cost option

One source of information for estimates of costs of upgrading to BT surface under PMGSY is a preliminary report on the survey of villages without connection via a BT road and the length of roads required to secure connection. The report provides a breakdown of roads according to the initial road surface and estimates the cost of upgrading to BT surface. The specifications are a carriageway width of 3.75m on a roadway including shoulders of 7.5m plus side drainage. Apart from the bitumen application, the specification (road width and sub-base and base) are similar to the RES WBM specifications (see section 5.3.3).

Table 11 summarises the estimated cost per km for roads requiring different levels of treatment. If the initial road condition is a good WBM surface, the cost of applying the BT surface is estimated to be Rp 281,000 (or US\$5876). The actual costs in many cases are likely to be higher because the poor existing condition of roads. The estimated full construction cost, where there is an earth road or track, a badly deteriorated road or no road is no road, is Rp 780,000 (or US\$16,311).

Table 11 Preliminary estimate of cost per km of different types of treatment to construct a BT road under PMGSY in Jabalpur

| Treatment required | Cost / km (Rp) | Cost / km (US\$) |
|------------------------|----------------|------------------|
| BT only | 281,000 | 5,876 |
| WBM and BT | 590,000 | 12,338 |
| Murram, WBM and BT | 650,000 | 13,593 |
| Full road construction | 780,000 | 16,311 |

Source:

The Jabalpur Implementation Unit also provided more recent broad estimate of cost per km based on contracts awarded. These estimates are higher. On average, upgrading from a WBM to BT surface including widening from 3m to 3.75m is expected to cost Rp 8.5 lakh (or about US\$17,800) per km while building a totally new road is expected to cost between Rp14 and Rp 16 lakh (between US\$29,000 and US\$33,000 per km).

It was not possible to obtain detailed information on the combination of labour and equipment in road construction but discussions with Jabalpur Implementation Unit indicated that the mode of operations on these roads were similar to the PWD contractor's on the Sihora – Majholi – Katangi Road (see section 5.3.1). Apart from equipment for bitumen treatment and vehicles for hauling of material, the main piece of equipment used by many contractors is a vibrating roller for compaction.

Although GOI has made a major resource commitment to PMGSY, funding is likely to fall short because of the scale of the programme and the decision to upgrade all qualifying roads to a BT surface irrespective of the initial condition of the road, accessibility requirements and traffic volumes (see section 4.2.6). Construction of some roads to a BT standard may be justified because of traffic volumes but lower cost labour-based options are more appropriate for roads serving smaller populations and lower traffic. A World Bank assessment of evidence from Andhra Pradesh suggests that a BT surface is unlikely to be justified for a road serving a population below 3000 unless it also serves another economic function.

Table 12 PMGSY in Jabalpur: Programme costs by treatment - alternative assumptions

| Treatment | Cost/km | | Connecting villages with population between 500 and 1000 | | | Connecting villages with population above 1000 | | | Connecting all villages with population above 500 | | |
|--|---------|---------|--|-------------|------|--|-------------|------|---|-------------|------|
| | | | Road length (km) | Total cost | | Road length (km) | Total cost | | Road length (km) | Total cost | |
| BT only | | | | | | | | | | | |
| RES preliminary estimates (Rp/km) | 281000 | Rp/km | 160.15 | 45,002,150 | Rp | 77.20 | 21,693,200 | Rp | 237.35 | 66,695,350 | Rp |
| RES preliminary estimates (US\$/km) | 5876 | US\$/km | | 941,074 | US\$ | | 453,643 | US\$ | | 1,394,717 | US\$ |
| More recent MPRRA estimate (Rp/km) | 850000 | Rp/km | | 136,127,500 | Rp | | 65,620,000 | Rp | | 201,747,500 | Rp |
| More recent MPRRA estimate (US\$/km) | 17775 | US\$/km | | 2,846,665 | US\$ | | 1,372,229 | US\$ | | 4,218,894 | US\$ |
| Labour-based lower upgrading option (Rp/km) | 281000 | Rp/km | | 45,002,150 | Rp | | 21,693,200 | Rp | | 66,695,350 | Rp |
| Labour-based lower upgrading option (US\$/km) | 5876 | US\$/km | | 941,074 | US\$ | | 453,643 | US\$ | | 1,394,717 | US\$ |
| WBM and BT | | | | | | | | | | | |
| RES preliminary estimates (Rp/km) | 590000 | Rp/km | 356.00 | 210,040,000 | Rp | 142.50 | 84,075,000 | Rp | 498.50 | 294,115,000 | Rp |
| RES preliminary estimates (US\$/km) | 12338 | US\$/km | | 4,392,304 | US\$ | | 1,758,156 | US\$ | | 6,150,460 | US\$ |
| More recent MPRRA estimate (Rp/km) | 1341667 | Rp/km | | 477,633,333 | Rp | | 191,187,500 | Rp | | 668,820,833 | Rp |
| More recent MPRRA estimate (US\$/km) | 28057 | US\$/km | | 9,988,150 | US\$ | | 3,998,066 | US\$ | | 13,986,216 | US\$ |
| Labour-based lower upgrading option (Rp/km) - WBM | 485000 | Rp/km | | 172,660,000 | Rp | | 69,112,500 | Rp | | 241,772,500 | Rp |
| Labour-based lower upgrading option (US\$/km) - WBM | 10142 | US\$/km | | 3,610,623 | US\$ | | 1,445,263 | US\$ | | 5,055,887 | US\$ |
| Murram, WBM and BT | | | | | | | | | | | |
| RES preliminary estimates (Rp/km) | 650000 | Rp/km | 99.00 | 64,350,000 | Rp | 38.50 | 25,025,000 | Rp | 137.50 | 89,375,000 | Rp |
| RES preliminary estimates (US\$/km) | 13593 | US\$/km | | 1,345,671 | US\$ | | 523,317 | US\$ | | 1,868,988 | US\$ |
| More recent MPRRA estimate (Rp/km) | 1391667 | Rp/km | | 137,775,000 | Rp | | 53,579,167 | Rp | | 191,354,167 | Rp |
| More recent MPRRA estimate (US\$/km) | 29102 | US\$/km | | 2,881,117 | US\$ | | 1,120,434 | US\$ | | 4,001,551 | US\$ |
| Labour-based lower upgrading option (Rp/km) - Murram | 400000 | Rp/km | | 39,600,000 | Rp | | 15,400,000 | Rp | | 55,000,000 | Rp |
| Labour-based lower upgrading option (US\$/km) - Murram | 8365 | US\$/km | | 828,105 | US\$ | | 322,041 | US\$ | | 1,150,146 | US\$ |
| Full road construction | | | | | | | | | | | |
| RES preliminary estimates (Rp/km) | 780000 | Rp/km | 114.00 | 88,920,000 | Rp | 22.00 | 17,160,000 | Rp | 136.00 | 106,080,000 | Rp |
| RES preliminary estimates (US\$/km) | 16311 | US\$/km | | 1,859,473 | US\$ | | 358,846 | US\$ | | 2,218,319 | US\$ |
| More recent MPRRA estimate (Rp/km) | 1500000 | Rp/km | | 171,000,000 | Rp | | 33,000,000 | Rp | | 204,000,000 | Rp |
| More recent MPRRA estimate (US\$/km) | 31368 | US\$/km | | 3,575,910 | US\$ | | 690,088 | US\$ | | 4,265,997 | US\$ |
| Labour-based lower upgrading option (Rp/km) - Murram | 400000 | Rp/km | | 45,600,000 | Rp | | 8,800,000 | Rp | | 54,400,000 | Rp |
| Labour-based lower upgrading option (US\$/km) - Murram | 8365 | US\$/km | | 953,576 | US\$ | | 184,023 | US\$ | | 1,137,599 | US\$ |

The labour-based approach to rehabilitate roads to a lower specification where this is justified, offers the advantages of (a) lower cost per km and the stretching of resources for the improvement of more roads and (b) higher employment for a given level of expenditure because the labour contents per km for WBM and murrum roads are typically higher than for BT roads. To demonstrate, tables 12 and 13 compare the cost of implementing PMGSY with a lower cost option.

Table 12 shows alternative cost estimates for different types of treatments by the size categories of villages to be connected. There are three cost estimates based on alternative cost per km assumptions with figures given in Rp and US\$ for each. “RES preliminary estimates” represents the earlier and lower cost estimate of upgrading to BT (see table 11). “More recent MPRRA estimate” is the higher estimate based on contracts awarded.

“Labour-based lower upgrading option” assumes different levels of upgrading depending on the existing condition of the road. It is assumed that where BT treatment only is required, the labour-based option would also include this treatment. For roads requiring WBM and BT treatment, it is assumed that the roads would be upgraded to WBM surface only under the lower cost option. For roads requiring murrum, WBM and BT and full road construction, upgrading to murrum only is assumed.

Table 13 PMGSY in Jabalpur: Programme costs under alternative assumptions - summary table

| | Road length (km) | Total cost | |
|---|------------------|---------------|------|
| All roads connecting villages with population above 500 | | | |
| RES preliminary estimates (Rp/km) | 1009.35 | 556,265,350 | Rp |
| RES preliminary estimates (US\$/km) | | 11,632,483 | US\$ |
| More recent MPRRA estimate (Rp/km) | | 1,265,922,500 | Rp |
| More recent MPRRA estimate (US\$/km) | | 26,472,658 | US\$ |
| Labour-based lower upgrading option (Rp/km) - Murrum | | 417,867,850 | Rp |
| Labour-based lower upgrading option (US\$/km) - Murrum | | 8,738,349 | US\$ |
| All roads connecting villages with population above 1000 | | | |
| RES preliminary estimates (Rp/km) | 280.2 | 147,953,200 | Rp |
| RES preliminary estimates (US\$/km) | | 3,093,961 | US\$ |
| More recent MPRRA estimate (Rp/km) | | 343,386,667 | Rp |
| More recent MPRRA estimate (US\$/km) | | 7,180,817 | US\$ |
| Labour-based lower upgrading option (Rp/km) - Murrum | | 115,005,700 | Rp |
| Labour-based lower upgrading option (US\$/km) - Murrum | | 2,404,971 | US\$ |

The total costs are based on the alternative cost per km estimates and road lengths to be upgraded. For example, to connect villages with population above 1000 persons, 77.2 km of roads require BT only treatment, 142.5 km require WBM and BT treatment and so on. Based on the calculations in table 12, table 13 summarises the total costs of connecting all the villages with population above 1000 and above 500 persons. The comparison shows that the cost of the lower upgrading option is only 33 per cent of the higher BT cost estimate and about 75 per cent of the lower BT cost.

These are rough comparisons based on incomplete information. A more thorough analysis based on more detailed information is required for more. Nevertheless, the comparisons show the potential for cutting costs by upgrading to more appropriate levels.

7. CONCLUSIONS AND AN OUTLINE FOR LABOUR-BASED STRATEGY AND PILOT PROJECTS

It was stated in section 2 that application of the labour-based approach is not only concerned with the choice of technology in the field but also with developing a sustainable approach to the rehabilitation and maintenance of rural roads. Sustainability requires greater reliance on cheaper local resources, development of local capability and adequate financing. It is also necessary to make a distinction between the labour-based approach and the labour intensive model with the primary objective of employment.

Current approaches to rehabilitation, construction and maintenance of rural roads use labour in a number of activities. A labour-based project could make some improvements at the operational level, for example by developing the capabilities of local contractors, introducing new forms of light equipment and making designs more flexible to make better use of locally available materials and reduce haulage costs. However, the most significant impact of the labour-based approach is likely to be at the strategic level, in particular by developing and implementing a policy on the appropriate level of upgrading of roads depending on accessibility requirements, cost-benefit considerations and availability of resources.

For rural roads, the most important programme in operation currently is the PMGSY for upgrading VRs and ODRs, MDRs are excluded. Its aim of BT connectivity is highly laudable and shows the commitment of policy makers to improving the rural infrastructure. In addition, a proportion of diesel tax has been hypothecated for this scheme. Such a favourable policy stance and resource commitment are often lacking in other parts of the world.

However, it is likely that resources will be inadequate for the BT connectivity targets to be met. Even if the resources are adequate, to commit them to construction of BT surface roads on low traffic volume roads may not be the best use of resources. Implementation through large contractors also effectively excludes local contractors and there is no maintenance provision beyond the first five years. In relation to schemes such as the PMGSY, the role of a rural roads agency would be to consider and develop lower cost options more reliant on local resources and capabilities.

Implementation of the approach requires attention to a number of planning, operational and technical issues. The foremost planning issue is that there is no single agency responsible for developing a strategy for the rural road network at the MP State level and making and implementing plans for the improvement and maintenance of the network. The role of a strategic rural roads agency would be to:

- (g) collect information on and assess the present condition of the rural roads network (MDRs, ODRs and VRs) and the access it provides and not just on the type of road surface;
- (h) develop guidelines for determining the appropriate types of rehabilitation and upgrading based on the initial road condition, road function and use and available resources;
- (i) develop a strategy for the maintenance of rural roads;
- (j) assess requirements for donor support, technical assistance and additional funding to support the heavy initial rehabilitation investment to bring the network up to a maintainable standard;

- (k) assess requirements for improving technical and management capabilities in public agencies and for private contractors and plan training activities;
- (l) make an assessment of resource requirements for a continuing sustainable programme of rehabilitation / upgrading and maintenance, and
- (m) make long-term plans based on available resources.

Development of a strategy requires studies and experiments related to technical and operational aspects in the field. These include:

- (a) assessment of the suitability of existing options (WBM and murrum) to BT roads;
- (e) experiments with labour-based construction and contractor operation on pilot projects to test and develop alternative methods and develop contractor capacity;
- (f) testing alternative maintenance methods on a pilot project with a view to assessing the suitability, resource and management requirements of alternative approaches, and
- (g) examination of design specifications to make them more suitable for labour-based methods or more appropriate for local physical, climatic or traffic requirements, and recommendation of changes if necessary.

A strategy for rural roads should also define the role of the employment generation oriented schemes (EAS and SGRY). With appropriate technical support within properly set out agreements, there is a role for community-based rehabilitation which works well if the assets being maintained are of direct, and largely exclusive, benefit to the community. In the context of local democracy in MP, local institutions are the focal points for expressing local needs, for planning local community works, and identifying and proposing projects to higher authorities and agencies. Integrated Rural Accessibility Planning (IRAP) as a participatory planning method for analysing the access situation at the local level and aiding the process of establishing priorities would make an important contribution to local level establishment of priorities and planning.

An ILO pilot project would provide support in the form of technical assistance at all the three interrelated levels: (a) the setting up and operation of a rural roads agency at the MP State level, (b) a labour-based pilot project in Jabalpur and (c) an IRAP project in Jabalpur.

References

Edmonds G A and de Veen J (1992) “A labour-based approach to roads and rural transport in developing countries”, *International Labour Review*, Vol. 131, No 1.

Green P A and Brown P D (1976) “Some aspects of the use of labour-intensive methods for road construction” Paper presented at a panel discussion, Indian Road Congress, Bhopal and New Delhi.

Hirway I and Terhal P (1994) *Towards Employment Guarantee in India: Indian and International Experiences in Rural Public Works Programmes*, Sage Publications, New York.

Keddemmen, W (1998) *Of nets and assets: effects and impacts of employment intensive programmes – a review of ILO experience*, Socio-economic Technical Papers No 1, Geneva, ILO.

Planning Commission (2001) *Report of Task Force on Employment Opportunities*, June, Government of India.

Relf C and Vaidya K G (1998) “International perspectives on public works programmes” *Aston Business School Research Paper Series No RP9824*, October.

Sud, I K, C G Harral and B Coukis (1976) “Scope for the substitution of labour and equipment in civil construction” Paper presented at a panel discussion, Indian Road Congress, Bhopal and New Delhi.

Tiwari R K (1990) *Rural Employment Programmes in India: The Implementation Process*, Indian Institute of Public Administration.

TERMS OF REFERENCE FOR LABOUR-BASED CONSULTANT
Strategy Document for a Labour-based Works Programme in Madhya Pradesh

BACKGROUND

Employment generation has been identified by the Ministry of Labour (MOL), Government of India (GOI) as the topmost national priority. At the request of the Ministry of Labour, Government of India, an employment sector mission was undertaken by the ILO during 30 July – 3 August 2001 with the basic purpose of initiating discussions with the constituents on possible ILO support in the effort for job creation for poverty reduction. On the basis of consultations during the mission, a “two-track” approach to ILO support was proposed and accepted by the MOL. One of the tracks is the development of policy perspectives on employment as a route out of poverty while the other is the development of an integrated approach to job creation and demonstration of the approach through pilot action programmes in selected areas (initially four districts in four different States). Jabalpur District in Madhya Pradesh is one of the selected districts.

A labour-based approach to infrastructure programmes is often an important component of an overall employment-oriented government policy. Jabalpur is the first district in which the role of labour-based projects is being examined under this initiative alongside with the contribution of local economic development and micro-finance strategies to employment creation. Studies under this initiative have already started in Muktsar district in Punjab. These do not include assessment of the labour-based approach at this stage. Work in the other two districts (Chittur in Andhra Pradesh and Cuttack in Orissa) is expected to start in 2002.

DESCRIPTION OF CONSULTANCY SERVICES

The objective of this consultancy is to:

- formulate a strategy document in cooperation with the State Government of the Madyha Pradesh

More specifically, this consultancy will assist the state government in

- (i) reviewing the current and previous experiences with labour-based methods in the infrastructure sector
- (ii) assessing the potentials for labour-based methods
- (iii) develop a clear strategy document which will enable the Madyha Pradesh Government to effectively and efficiently manage and coordinate labour-based initiatives in the infrastructure sector.

The consultancy will be carried out through meetings, interviews and document research in Madyha Pradesh and the ILO’s office in Delhi.

Under the overall supervision of ASIST AP, the Consultant will:

- review the current and previous experiences with labour-based methods;
- assess the policies of the Madyha Pradesh Government regarding labour-based methods;
- inventorise the donors attitude towards labour-based methods;
- assess the scope for labour-based methods in the infrastructure sector;
- describe the technical, financial and organisational aspects for labour-based projects;
- review the training possibilities currently available;

- assess the need for technical assistance;

The draft outline of the document is as follows:

STRATEGY DOCUMENT

1. Introduction

Explanation of labour-based methods and of the use of this document.

2. Review of Current and Previous Experiences with Labour-based Methods

The current and previous experiences with labour-based methods have shown that these methods are appropriate and well accepted

3. Policy of the Government of Madhya Pradesh towards Labour-based Methods

4. Donors Attitude towards Labour-based Methods

Some donors have shown interest to fund labour-based projects and programmes in Madhya Pradesh

5. Scope for Labour-based Works

According to our understanding there is a large scope for labour-based methods.

6. Technical Aspects

Infrastructure Identification

Describe the procedure and the criteria. Refer to cooperation with IRAP (used if possible).

Tools and Equipment

Most tools and equipment can be purchased or manufactured locally. Assess the existing market for hiring equipment

Recruitment of Labour

Describe the method used and alternatives with advantages and disadvantages.

Implementation

Short description of activities in the field.

Task Rates

Refer to task rates used.

Contractors

Describe the current contract management procedures used for infrastructure works and discuss possible alternatives.

Maintenance Methods

Describe the set-up and implementation of the maintenance activities.

7. Financial and Organisational Aspects

Financial Aspects

a) Cost

Describe the estimated cost for key infrastructure works, such as roads as costs per kilometre.

b) Revenues

Describe the possible contributions (Government, villages and donors) to the implementation of rural infrastructure construction and maintenance.

c) Responsibilities

Describe who will be responsible and how the accounting will be made.

Organisation

a) At state level

Describe the organisational structure for infrastructure works and the responsibilities.

b) At the local government level

Describe the set-up and responsibilities concerning the implementation of the projects.

8. Outline Plan for the development of Labour-based works

Depending on different assumptions of inputs and demand.

9. Recommendations

Some possible recommendations could be:

- It would be useful to create a unit at state level to manage and coordinate labour-based initiatives;
- The Government should increase its contribution for the implementation of a labour based programme;
- A reliable and safeguarded funding over an extended period of time is required;

QUALIFICATIONS REQUIRED

- 1) A civil engineer/rural development economist with a solid working experience in the rural infrastructure development sector.
- 2) Minimum five years experience in labour-based rehabilitation and maintenance projects.
- 3) Experience in developing strategy, programme and project documents for the rural roads sector.
- 4) Fluency in written and spoken English.
- 5) Ability to communicate effectively at all levels in relation to the formulation and presentation of a strategy document for the rural roads sector.