

Regional Workshops on Project Formulation and Quality Monitoring.

MORD/NRRDA organized Regional Workshops at IIT Roorkee, BITS Pilani, Bhubaneswar, Chennai and Shillong on Project Formulation and Quality Monitoring, during the month of September 2005 to deliberate on issues concerned, in the presence of State Officials, State Technical Agencies (STAs), Principal Technical Agencies (PTAs) and National Quality Monitors (NQMs).

Constraints in the present system, measures for overcoming them and the need for attitudinal changes among the stake holders were discussed in depth, through case studies and visuals.

The feedback has helped in identifying the deficiencies and remedial actions for improving the Quality of DPR preparation and Quality Monitoring Mechanism.

Based on the feedback, follow-up actions have been initiated at NRRDA.



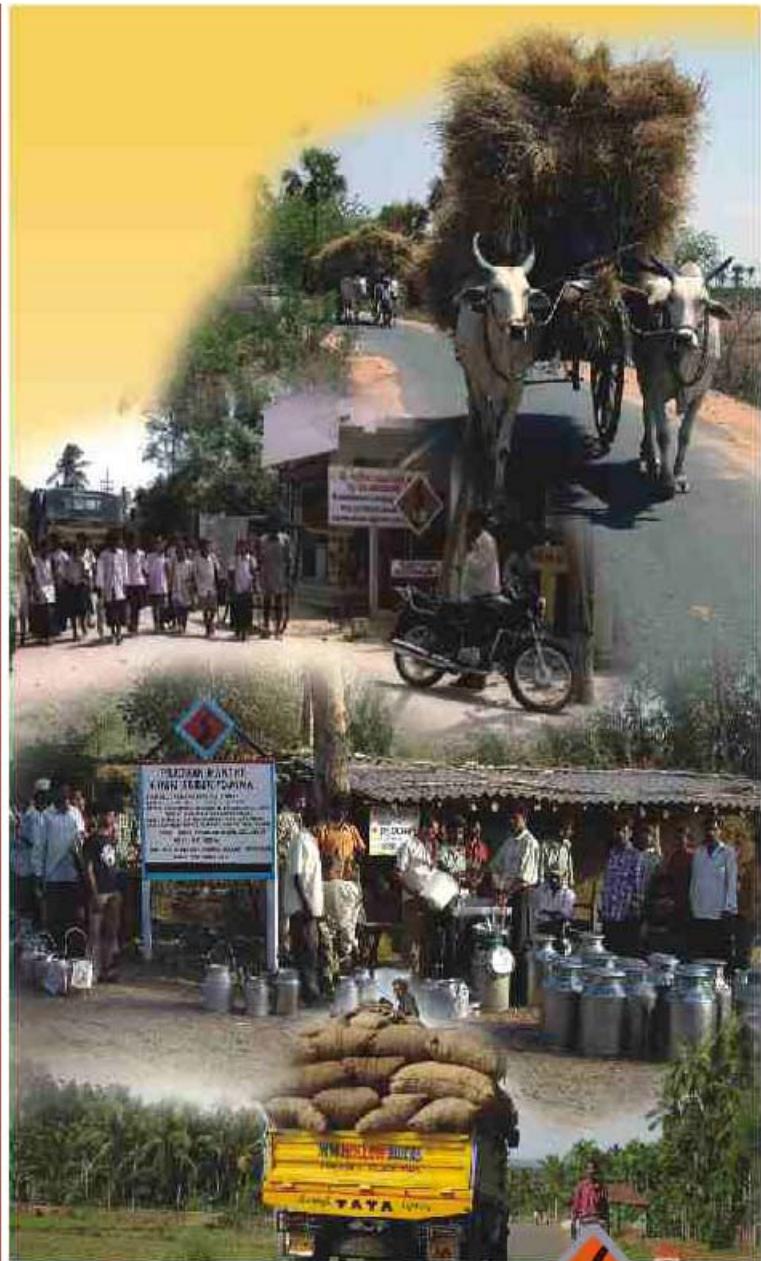
National Rural Roads Development Agency
Ministry of Rural Development, Government of India
5th Floor, 15 NBCC Tower, Bhikaji Cama Place, New Delhi - 110 066
email: nrrda@pmgsy.nic.in www.pmgsy.nic.in www.pmgsyonline.nic.in

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Pradhan Mantri Gram Sadak Yojana





सचिव

भारत सरकार

ग्रामीण विकास मंत्रालय

SECRETARY

Government of India

Ministry of Rural Development



MESSAGE

Road is vital for human prosperity. From time immemorial, roads have been the crucial vehicle for the transmission of civilizational influences across the globe. We cannot imagine our modern economy without an effective network of roads. The PMGSY is the major national initiative to achieve rural connectivity in a given timeframe. It has already done wonders for the rural habitations which have benefited from the programme in terms of access to market and other infrastructural facilities. I have personally seen some of the roads built under the PMGSY and they are an impressive testimony to the planned and scientific manner in which the small body of dedicated managers have gone about executing this ambitious scheme. They deserve support and kudos from all of us for trying to achieve excellence in a vital component of rural infrastructure.

Let me end by recalling what R.L. Stevenson said about the significance of roads "*All I seek the heaven above/ and the road below me*".

(Pratyush Sinha)

Secretary to the Government of India,
Ministry of Rural Development

New Delhi,
28th October, 2005



The National Rural Roads Development Agency (NRRDA) was established on 14th January 2002 as the dedicated agency of the Ministry of Rural Development for the operational management of the rural roads programme PMGSY.

Grameen Sampark is a newsletter of the NRRDA containing items of topical interest. For official text or detailed information please contact NRRDA or visit the website.

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e-mail: nrrda@pmgsy.nic.in
Website: www.pmgsy.nic.in

Content editing, Design & Printing by Akhil Chandra Associates: N-70/4, South Avenue, Sainik Farm, New Delhi-110062
Ph.: 55427077

For article contribution and free subscription contact:

Dr. B.P. Chandrasekhar,
Director (Tech.), NRRDA,
(e-mail: bpc@alpha.nic.in).

Note: Accepted articles may be condensed.



Editorial

Rural Connectivity, Agricultural Growth and Poverty Alleviation

Extensive empirical research has substantiated that lack of connectivity and isolation is a primary cause of persistence of poverty in the rural areas. Connectivity opens up economic opportunities, facilitates mobility of people and products and enables rural households to access basic public services. Thus, investment on rural roads is expected to stimulate agricultural growth, as well as, enhance livelihood opportunities for the rural poor, thereby reducing rural poverty.

Linkages between public investment on rural connectivity, agricultural growth and poverty alleviation in the Indian context were investigated in a research report authored by Shengenn Fan, Peter Hazell and Sukhadeo Thorat. Using state-level data on government spending from 1970 to 1993, the study attempted to quantitatively measure how different types of public investment affect agricultural growth and rural poverty. The model estimated the number of poor people who would be raised above the poverty line for Rs. 1 million each (1993 constant prices) of additional investment in eight different components of public spending: roads, research and extension, education, rural development, health, irrigation, soil and water conservation and power. Accordingly, government expenditures were ranked in terms of their effectiveness in poverty alleviation.

The findings of this study are striking. Government spending on roads was found to have the largest impact on rural poverty. For each Rs. 1 million increase in investment in roads, 165 poor people would be enabled to cross the poverty line. Its impact on poverty was nearly twice as large as that of the next best poverty reducer - Government investment in agricultural R&D. Investment in roads was also found to be contributing significantly to productivity growth. An additional Rs. 100 billion (in 1993 prices) invested in roads would increase productivity growth by more than three percent.

The results of this study clearly indicate the conceptualisation of PMGSY and progressively increasing outlay for the programme. The challenge for all of us is to use this massive sum to network rural India through better roads which would be durable and sustainable.

(J.K. Mohapatra)
Director General, NRRDA



Detailed Project Reports (DPRs) for Rural Roads under PMGSY

Dr. B.P. Chandrasekhar, Director (Tech.), NRRDA

Background

Pradhan Mantri Gram Sadak Yojana (PMGSY) aims at providing Quality Rural Roads. The quality of a road is referred to as the quality in performance as well as sustainability. It is worth noting that the quality of the Rural Roads begin with quality in planning and design. Planning and Design is part of preparing the Detailed Project Report. Though, the Rural Roads built earlier had an estimate prepared for assessing the cost of construction, it is not adequate when one thinks of a Detailed Project Report. As a matter of fact, estimate for a road comes only in the end of a DPR, but many more details are required in the preparation of a comprehensive DPR for Rural Roads.



The Guidelines of PMGSY on Project Preparation

The objective of preparing a DPR is to present the details of Investigations, Design with choice of Technology, Assessment of accurate quantities and Cost Estimation along with necessary drawings to enable the execution of the Project.

The documents of PMGSY Programme Guidelines of Ministry of Rural Development (MoRD) as well as the Operations Manual of National Rural Roads Development Agency (NRRDA) emphasized the need for preparing a good DPR and elucidated the content and the processes for Project Preparation and scrutiny, realizing the fact that the DPR prepared by the Field Engineers, when subjected to scrutiny before being considered for clearance, will help in removing the deficiencies, if any, and also for ensuring optimal provisions.

The Contents of DPR and the Processes Involved

As is common for road projects, the DPR shall contain a brief background of the project, the investigations for collecting necessary information on the aspects of Finalization of Alignment, Geometric and Structural Design, Location and Design of Drainage System, Design and Provision of Protection Works and the Provision of Road Furniture, as required.

The processes include: Transit Walk with the concerned Engineer, officials of Revenue and Forest Departments and the Community Representatives for finalizing and fixing the alignment, topographical survey, soil survey, traffic survey and hydrological survey for assisting the design, analysis of rates for the given specifications for estimation and preparing the complete document with working drawings for helping the implementation in the field.

The PMGSY provided for a system of Project Scrutiny at different levels starting from the PIU. After the PIU satisfies with the design, estimation, making sure that land is available free of encumbrances, the DPRs, along with associated documents such as the proceedings of State Level Standing Committee (SLSC), district wise allocation, Core Network of the concerned blocks, Comprehensive New Connectivity Priority List (CNCPL)/ Comprehensive Upgradation Priority List (CUPL) etc. will be submitted to the State Technical Agency (STA). The STA then scrutinizes the project proposals with respect to adequacy of Investigations, data analysis and interpretation, design and estimation. After completing the scrutiny, through the Executing Agency, the summary of Project Proposals in formats B & C will be forwarded to NRRDA, along with a consolidated report on the scrutiny of the proposals. The STA is expected to make sure that all corrections suggested by it are attended to by the PIUs and the final details of the road works of the proposals are entered in OMMAS online.





NRRDA randomly checks the designs, provisions, cost trends and tries to identify systemic deficiencies.

Common Deficiencies observed in the DPRs

The State Executing Agencies started systematic preparation of the DPRs from Phase III onwards. Even though, there is a marked improvement in the quality of DPRs in general, it is disappointing to note several deficiencies at the project preparation and scrutiny stage in many States. The deficiencies are spread over the Executing Agencies, STAs at Project Preparation and Scrutiny Stage and reporting by both. The following is the summary of deficiencies observed:

Deficiencies in Project Selection

- Errors in the preparation of Core Network.
- Disproportionate allocation to the Districts.
- Deficiency in the Preparation of CNCPL/CUPL.
- Inadequacy in the consultative process.
- Deviations from CNCPL/CUPL in the roads selected.

Deficiencies in the Project Preparation & Scrutiny

- Inadequate Investigations.
- Failure to check co-relations in the soil properties.
- Inaccurate estimation of Design Parameters.
- Non adherence to the provisions of RRM for Pavement Component Design.
- Inadequate Geometric Design.
- Failure to identify cost aberrations in the components.
- Inappropriate location and design of CD Works.
- Provisions not permissible as per guidelines.
- Deficiency in checking the Schedule of Rates/Maintenance Cost.
- Failure to investigate alternate designs for optimality.

Deficiencies in Reporting

- Incompatibility of data on connectivity status.
- Incomplete data entry on OMMAS.
- Failure to clear the proposals on-time at STA Level.
- Incomplete data in Format "C".
- Failure to give specific remarks on individual project proposal and submission of consolidated reports by STAs.

Conclusions

It is needless to say that the majority of the deficiencies in the Project Preparation can be attributed to the Engineers of the

Executing Agencies. The reasons could be many, such as lack of awareness, inadequacy of time, non-availability of assistance in data collection, inadequate guidance etc. In order to overcome the difficulties NRRDA has initiated and organized several training programmes in which preparation of DPR is one of the important topics. Even those Engineers, who have not undergone training, can always understand the requirements of a DPR and the method of its preparation. No amount of help extended in creating awareness or equipping the departments with all necessary facilities will result in bringing out quality DPRs unless the Engineers have a "Willingness to do". It is the seriousness and commitment of the junior level officers and adequate guidance from the senior engineers that will help in realizing the objective of preparing comprehensive quality DPRs.

The role of an STA is much more important in providing technical assistance, advice, guidance and insistence, if required, which is likely to bring out the attitudinal changes in the field engineers that will reflect on the quality of DPRs and on the quality of Rural Roads.

Finally, the State Executing Agencies, generally SRRDAs should plan the preparation of DPRs in advance, giving adequate time necessary for field investigations and



preparing comprehensive DPRs instead of setting unattainable targets, which forces the officers to compromise on investigations and somehow produce a report.

It is hoped that all concerned should feel the responsibility of preparing the DPRs individually and together with others in order to achieve the common objective of getting quality DPRs.



Let's Do Quality

H.K. Srivastava (Director Projects-I), NRRDA

The term 'quality' encompasses the totality of features and characteristics of a product or service on its ability to satisfy stated or implied needs. It needs to be viewed in a wider perspective to include the process involved in the product. The process may involve a simple task like preparing a cup of tea, to a multidisciplinary complex task of construction and management of metro rail network for a city. In either of the cases, their ability to meet the required (or stated) needs would determine the quality of the product. Quality cannot be achieved by holding all employees accountable for their job behavior, equipping oneself with information alone, having all kinds of gadgets around or using new technology. Nor can it be achieved by issuing circulars or officer orders. These tools may improve certain components without making any appreciable change in the quality of finished product.

There are seven components to a complete quality process. These are: Top Management Commitment; Leadership; Employee Commitment; Communication; Training; Measurement and; Recognition, Gratitude and Celebration. In the July-Sept 05 issue of Grameen Sampark the first three components were discussed. In the present issue remaining components are described.

Communication: Any communication has two parts. One is transmission and second is the reception. Transmission covers what the speaker or the writer is very sure that he or she has said. Is it also which they intended to say or is it what they meant to say? It is not very important under which category the speaker wants to put what he wanted to communicate. What is important is the reception what the recipient should have heard or understood.

Reception is what people hear, which may not be the same thing that the speaker thought he said. People understand things in different ways. As such, it is necessary to share a lot of information in a consistent manner. Maybe it would be necessary to transmit the message in several ways. Frequently asking *Koi Shak* could be one good practice to really completing the communication process.

Training: Training is the single biggest investment cost in terms of cash and time of the employees. Quality specific training cannot and should not be at the expense of technical training. Quality training is in addition to it. Technical training addresses the right things to do. While quality specific training addresses adding tools to discover how to do the right things even better. Many times the training activity is out-sourced. However, once the training organization has provided a quality team-leader course and conducted the initial trainings, the organization should take over. In this way the organization can begin changing the course content to reflect their annual expectation. Thus, the course would steadily improve. The organization has to maintain the control of the mechanics and

direction of its quality process and not leave it to outside training organizations or consultants.

Measurement: Measurement is an important tool. If you do not know where you were, when you started and, where you are now, how can you tell if you have made progress? However, a measurement should not be used as a weapon for punishment or treated as the only measure of progress. Measurement has two valid uses in the context of a quality process. One is to gather data that can be used as a source of ideas for improvement, and the other, to check progress against plans. If progress does not meet expectations it may be necessary to revert to the first reason i.e., to use data to generate ideas for improvement. The basic tool for measurement is not all that complex. It has to be project specific as the same tool will not be suitable for manufacturing units, services and construction. The ISO series is a powerful tool but it is essentially a measurement and record-keeping system. This is one of the forms of measurement, which has been given undue emphasis, at the expense of other components of quality such as leadership, communication, employees, involvement etc.

Recognition, Gratitude and Celebration: The organization, particularly the Senior Management, must be thankful to its employees for their contribution to the efforts to improve. The two reasons for it can be Emotional and Rational. The emotional reason is that a person who has made a contribution deserves the warm feeling that any human gets when they feel thanked. The rational reason is that if the employees hear 'thankyou', there is a good chance that they will make further improvements.

Different people hear 'thankyou' in different ways. Money, a symbolic gesture, public recognition, or being included in a printed news story works for some. For others, it is sufficient to being personally thanked by Senior Management. However, it must be recognized that 'thank you' is a sign of gratitude and not fair payment. The gratitude extended through the quality process should not replace, in any way, fair payment through wages, bonus or promised incentives.

Thus, we find that the current practice of managing quality by numbers alone requires a re-look. There are other factors, as brought out above, which are equally important and need to be considered if an organization desires to attain the status of a 'quality organization'. The system of punishing individuals for perceived poor quality also does not help unless the entire organization is geared up in a systematic way and individuals empowered to achieve what their desires to achieve. It would be necessary to create an environment within the organization where quality performers have the incentive to perform the greatest incentive being the feeling of being part of a 'quality organization'.



PMGSY in Parliament (Monsoon Session)

C.R.K. Nair, Director, Ministry of Rural Development

During the Monsoon session of Parliament, which commenced on 25th July, 2005, 1 Starred Question (for oral answer) and 11 Unstarred Questions (for written answer) about PMGSY were raised in Lok Sabha. 1 Starred Question and 11 Unstarred Questions were raised in the Rajya Sabha as well on PMGSY. Also, one Calling Attention Motion figured in the proceedings of the Lok Sabha.

Lok Sabha

On 29th July, 2005, Shri Hiten Barman and Shri Balashowry Vallabhaneni asked a Starred Question in the Lok Sabha regarding State-wise details of the roads constructed/proposed to be constructed, particularly in remote and rural areas under the Pradhan Mantri Gram Sadak Yojana during the Tenth Plan and the steps taken for the release of funds to the States for achieving the targets within stipulated time and construction of the incomplete roads. In his Reply, the Minister of Rural Development, Dr. Raghuvansh Prasad Singh, stated that the 'Bharat Nirman' programme launched in the current year has set a goal to connect all villages that have a population of 1000 (or 500 in hilly/tribal areas) with an all weather road by the year 2009. This requires about 1,55,000 kilometers of roads to be constructed during the years 2004-05 to 2009-10. He also informed the Lok Sabha that the funds for PMGSY are released to the States generally in two instalments. The release of funds to the States is governed by the level of utilisation of funds earlier released to the States and the physical progress of works, as stipulated in the PMGSY Guidelines. The Lok Sabha was also informed in the Reply that since the release of funds depends on the progress of works, all the States are regularly advised by the Ministry of Rural Development to expedite the execution of PMGSY works and make payments to the contractors without any delay. In addition to the Starred Question, there were three Unstarred Questions on 29th July, 2005, covering various aspects of implementation of PMGSY in the States. Shri Brajesh Pathak, Shri Subodh Mohite, Shri Shrinivas Dadasaheb Patil and Shri Ramsevak Singh wanted to know whether the Government has reviewed the implementation of PMGSY in the country and the action

taken by it with regard to any specific complaint of corruption/irregularities in the implementation of the scheme. Smt. Suryakanta Patil, Minister of State, informed the Lok Sabha that the Ministry of Rural Development regularly reviews the implementation of PMGSY in each of the States through monthly progress reports received from the States and apart from this, the progress is also reviewed in the



Regional Review Meetings with the States. The Lok Sabha was also informed that no specific complaint of corruption/irregularities in the implementation of PMGSY have been received in the Ministry of Rural Development. Shri Iqbal Ahmed Saradgi wanted to know the details of the proposals pending under the Pradhan Mantri Gram Sadak Yojana for environmental and forest clearance and whether the Ministry of Rural Development has taken up the matter with the Ministry of Environment and Forests. On the same day, five Members viz. Mohd. Shahid, Prof. Mahadeorao Shiwankar, Mohd. Tahir, Shri Narendra Kumar Kushwaha and Shri Munshi Ram, while referring to a news report in the daily 'Rashtriya Sahara' on 6th June, 2005, wanted to know whether the Ministry of Finance has raised certain objections



to the amount spent on the construction of rural roads. In her Reply, Shrimati Suryakanta Patil, Minister of State stated that the Ministry of Finance has not communicated any objections to the Ministry of Rural Development about the expenditure on construction of roads under the Pradhan Mantri Gram Sadak Yojana (PMGSY).

On 5th August, 2005, there were two Unstarred Questions in the Lok Sabha. Maj. Gen. (Retd.) B.C. Khanduri, AVSM, wanted to know whether the Government has carried out any assessment of the cost of road construction under the Pradhan Mantri Gram Sadak Yojana for different types of terrain in the country and also whether the Government has made any arrangements for supervising the construction by having consultants or supervisors from the Centre itself. In Reply, Shrimati Suryakanta Patil, Minister of State, stated that the Government of India has not carried out any general assessment of the cost of road construction under Pradhan



Mantri Gram Sadak Yojana for different types of terrain in the country. It was also stated that the cost of road construction under the scheme is estimated in the Detailed Project Reports (DPRs) for each road work, prepared by the State Government, based on the investigations carried out on site specific conditions. The Reply went on to state that the Ministry of Rural Development had advised the 10 Core States, 2 Hill States and 7 North Eastern States on 13th June, 2005, that they could engage Project Implementation Consultants (PICs) to assist Programme Implementation Units (PIUs) in preparation of the Project Proposals, Work Procurement, Construction Supervision, Project Performance, Monitoring, Training of PIU and Contractor personnel, Application of Social and Environmental Safeguards. In response to the other Unstarred Question on 5th August, 2005 by Shri Sarbananda Sonowal about suggestions by the Confederation of Indian Industries for concreting of village roads, the Lok Sabha was informed by

Shrimati Suryakanta Patil, Minister of State, that the Ministry of Rural Development has not received any recommendation from the Confederation of Indian Industry (CII) in this regard.

On 12th August, 2005, there were six Unstarred Questions in the Lok Sabha on PMGSY. Shri Adhairao Patil Shivajirao and Shri Ganesh Singh wanted to know whether the Government has sought financial assistance/loans from the World Bank or any other foreign financial institutions for Pradhan Mantri Gram Sadak Yojana and the efforts being made by it for timely completion of the project. In Reply, the Lok Sabha was informed that the Asian Development Bank (ADB) has approved a loan of US\$ 400 million and World Bank has agreed to a loan/credit of US\$ 399.5 million to support the programme of total rural connectivity under the PMGSY. The Reply also contained that the total estimated funds requirement for Rural Road component of 'Bharat Nirman' upto 2009-10 was Rs. 48,000 crores. Shri Sushil Kumar Modi wanted to know whether the Government has increased the funds allocated under Pradhan Mantri Gram Sadak Yojana from Rs. 150 crores to Rs. 325 crores for construction of roads in Bihar and whether the work of construction of the roads in the State has been assigned to Central Agencies. Shrimati Suryakanta Patil, Minister of State, stated in her written Reply that the annual allocation under Pradhan Mantri Gram Sadak Yojana for the State of Bihar has been increased from Rs. 150 crores to Rs. 332 crores for construction of roads in the year 2005-06 and that since the progress of works in Phases I & II of PMGSY was hampered by the constraints of executional capacity, the Ministry of Rural Development agreed to the engagement of Central Agencies viz. National Buildings Construction Corporation Ltd. (NBCC), National Hydroelectric Power Corporation Limited (NHPC), National Projects Construction Corporation Ltd. (NPCC), IRCON International Limited (IRCON) and Central Public Works Department (CPWD), for execution of works of Phase-III (2003-04) onwards at the request of the State Government on 28th June, 2004. Shri P.C. Thomas asked a General Question whether roads under the Pradhan Mantri Gram Sadak Yojana are given in different Phases to the States as per finalisation by the concerned State and the State-wise number of Phases completed so far and the Phase which is now operating. The Minister of State, Smt. Suryakanta Patil, replied that the proposals received from the State are approved after scrutinizing them and Central assistance is provided only after the essential formalities are completed by the State concerned. In Reply to another Unstarred Question by Kunwar Manvendra Singh and Shri E.G. Sugavanam about use of jute geo-textiles in road construction under PMGSY, it was stated that the Ministry of Rural Development has approved a pilot project for use of jute geo-textiles in construction of 2 roads each in the States of Assam,



Chhattisgarh, Madhya Pradesh, Orissa and West Bengal, in association with the Jute Manufacturers Development Council (JMDC), under the Pradhan Mantri Gram Sadak Yojana. The total cost of the project is Rs. 1790.05 lakhs covering a total road length of 47.84 kms. In yet another Question, Maj. Gen. (Retd.) B.C. Khanduri wanted to know the reasons for slow progress under Pradhan Mantri Gram Sadak Yojana in Uttaranchal during the last three years. In the written Reply the Minister of State, Smt Suryakanta Patil, informed the Lok Sabha that the Government of Uttaranchal has reported that lengthy and multistage process of transfer of forest land, limited working seasons, extreme weather conditions, non-availability of contractors with adequate capacity, excessive rains and landslides during monsoon causing damage to the roads, longer length of roads to be constructed for which only single working face for the machines is available, rocky mountains stretches obstructing forward movement of machines and delay in the construction of connecting bridges are the main reasons for the slow progress. The Minister of State also gave the details of the funds released to Uttaranchal during the last three years and utilization reported by the State. In her written Reply to another Question by Shri. Sushil Kumar Modi, the Minister of State stated that the Government had called a Meeting of the Members of Parliament from Bihar on 12th May 2005 for discussing the execution of Pradhan Mantri Gram Sadak Yojana road works in Bihar.

In addition to the Questions, two matters of Urgent Public Importance were raised in the Lok Sabha under Rule 377, on Implementation of PMGSY. On 22nd August, 2005, Shri Ilyas Azmi called for inclusion of all villages with a population of more than 1000 people in Hardoi and Khiri districts of Uttar Pradesh under PMGSY during 2005-06. On 29th August, 2005, Shri Zora Singh Mann highlighted the need to construct roads under PMGSY in Ferozepur Parliamentary Constituency in Punjab.

Major General B.C. Khanduri (Retd.) moved a Calling Attention Motion in Lok Sabha on 25th August 2005 to call the attention of the Minister of Rural Development on the situation arising out of unsatisfactory utilization of funds under the Pradhan Mantri Gram Sadak Yojana in Uttaranchal and steps taken by the Government in regard thereto. The Minister of Rural Development, Dr. Raghuvansh Prasad Singh, in his Reply, indicated the year wise allocations and releases of funds to Uttaranchal under PMGSY, highlighting that against the total allocation of Rs. 395 crore to the State upto the year 2005-06, the State could take only Rs. 201.04 crore due to slow progress. The Minister also listed the various efforts made by the Ministry of Rural Development over the years, to impress upon the State Government, at various levels, about the need for expeditious completion of

PMGSY works. To a supplementary matter raised by the Member of Parliament about non-inclusion of certain road works, the Minister informed the Lok Sabha that road works to connect eligible habitations in the districts with international borders can be considered separately, subject to recommendation from the Ministry of Home Affairs.



Rajya Sabha

On 27th July, 2005, Shri Rajkumar Dhoot wanted to know whether the Pradhan Mantri Gram Sadak Yojana (PMGSY) was funded through the rural roads share of Diesel Cess of Rs. 1 per litre and the money received through the Diesel Cess during the last three years and likely to be received during 2005-06. He also wanted to know the details of roads constructed so far in different States/UTs under PMGSY and the amount spent in each case. In her Reply, Shrimati Suryakanta Patil, Minister of State stated that the Pradhan Mantri Gram Sadak Yojana is funded through the rural roads share of Diesel Cess, which at present is Rs. 1.50 per litre. She also informed the Rajya Sabha that the revenue collection from Diesel Cess during the years 2002-03, 2003-04, 2004-05 and likely revenue collection during 2005-06 was Rs. 4074.38 crores, Rs. 5966.70 crores, Rs. 7441 crores (provisional) and Rs. 9962 crores (Budget Estimates) respectively.

On 3rd August, 2005, there were 3 Unstarred Questions on PMGSY. In Reply to a Question by Shri T.T.V. Dhinakaran, Shrimati Suryakanta Patil, Minister of State, stated that the World Bank funded Phase I of PMGSY is being presently implemented in four States viz. Jharkhand, Himachal Pradesh, Rajasthan and Uttar Pradesh. She further stated that Bihar is also proposed to be included in Phase I of the World Bank assisted PMGSY in addition to the four States already covered under the programme. In response to another Question by Shrimati Ambika Soni and Dr. T. Subbarami



Reddy, Shrimati Suryakanta Patil, Minister of State, stated that the Ministry of Rural Development had forwarded State-wise list of 272 cases requiring clearance under the Forest (Conservation) Act, 1980 to the Ministry of Environment and Forests, on 2nd May 2005, requesting to take up the matter with the concerned authorities in the States. In Reply to another Unstarred Question by Shri Nand Kishore Yadav, the Rajya Sabha was informed that the Ministry of Rural Development does not maintain district level data on



villages/habitations connected or to be connected by all-weather roads. The Rajya Sabha was further informed that the Rural Roads component of Bharat Nirman has a goal of providing connectivity to all villages with a population of 1000 (500 in the case of hilly/tribal areas) with an all-weather road by 2009.

On 10th August, 2005, there were 1 Starred and 2 Unstarred Questions in Rajya Sabha. Prof. M.M. Agarwal asked a General Question (Starred) regarding implementation of PMGSY in the States. Minister of Rural Development, Dr. Ranghuvansh Prasad Singh informed the Rajya Sabha that the annual budgetary allocation under PMGSY is released to the States phase-wise and the expenditure is also monitored phase-wise. Shri Dara Singh Chauhan wanted to know whether the Pradhan Mantri Gram Sadak Yojana has been abolished or withheld for some days. He also wanted to know reasons for non-inclusion of any road in various districts of Eastern Uttar Pradesh. In Reply to a general Question by Dr. Gyan Prakash Pitania, Shrimati Suryakanta Patil, Minister of State stated that according to reports received from the States/UTs upto June, 2005, 74,339

kilometres of road has been constructed and at all India level and 20,799 eligible habitations have been connected. She also informed the Rajya Sabha that in Rajasthan, 11,056 kilometres of road has been constructed and 2951 eligible habitations have been connected.

On 17th August, 2005 also there were 3 Unstarred Questions. In Reply to a Question by Shri Dilip Singh Judev, Shri A. Narendra, Minister of State, informed the Rajya Sabha that according to the PMGSY Guidelines, ensuring the quality of road works is the responsibility of the State Government concerned. The quality of every road work is required to be examined by Programme Implementation Unit and State Quality Monitor appointed by the State Government. However, as the third tier of Quality Mechanism, the National Quality Monitors are engaged for inspection, at random, of the road works under the programme. The Rajya Sabha was also informed that the PMGSY Guidelines provide for plantation of fruit bearing and other suitable trees on both sides of the roads, by the State Governments/Panchayats from their own funds. In Reply to another Unstarred Question by Shri N.R. Govindarajar, Shri A. Narendra, Minister of State informed the Rajya Sabha that no assistance from National Bank for Agriculture and Rural Development (NABARD) has been obtained for the Pradhan Mantri Gram Sadak Yojana. In his Reply to another Unstarred Question by Shri Bashishtha Narain Singh, Shri A. Narendra, Minister of State, informed the Rajya Sabha that the annual allocation for Bihar during the current financial year (2005-06) under Pradhan Mantri Gram Sadak Yojana is Rs. 332 crores. He also stated that out of 24321 unconnected habitations in Bihar, 17920 habitations are required to be covered under PMGSY. Till 31st July, 2005, 1793 habitations have been covered under PMGSY.

There were 2 Unstarred Questions on 24th August, 2005. In Reply to a Question by Shri Janardhana Poojary, Smt. Suryakanta Patil, Minister of State, stated that the Government of Karnataka has forwarded proposals for inclusion of road works in Phase IV and revision of costs of Phase I and Phase II road works under PMGSY. The Rajya Sabha was also informed that the Government of India has approved the revision of costs of Phase I and Phase II road works and the State Government had been advised to forward revised proposals for Phase IV by selecting road works in accordance with the PMGSY Guidelines. Shri Bashishtha Narain Singh also wanted to know the amount sanctioned by Government under Pradhan Mantri Gram Sadak Yojana in Uttar Pradesh and Himachal Pradesh during the last three years, to which the Minister of State gave the details of value of proposals cleared and the amount released to these two States during the period, in writing.



Project Management Consultancy for Capacity Building and Institutional Development

Sushant Balliga, Director(Projects), NRRDA with Inputs from The Louis Berger Group

As part of the PMGSY, the States of Madhya Pradesh and Chhattisgarh have been identified as two of ten States with the greatest road length required to connect the rural population under PMGSY criteria. The Rural Roads Sector I Project (RRS I P) aims to improve 11,000 km of rural roads, divided into 5,500 km each in Chhattisgarh and Madhya Pradesh. The project loans are valued at US \$ 400 million.

Consultancy Services to NRRDA

The Project Management Consultants (The Louis Berger Group & Hirab International) were contracted by the NRRDA in April 2005 to provide Project Management Consultancy Services over a four year period for implementation of RRP 1. The PMC team started mobilization on the 1st of June 2005 gradually building up to a team of 16 professional staff split between Capacity Building & Training and Project Implementation & Management.

Training and Capacity Building

Under this Agreement, PMC's primary objectives and duties are as follows:

- Provide Project Management Assistance.
- Provide Project Performance Monitoring Assistance.
- Provide Road Maintenance Planning and Management Assistance.
- To Build the Capacity of the PMGSY Stakeholders.

A central part of the Project Management Consultant's TOR is to plan, provide and monitor various levels of capacity building for road asset management in the two states. The capacity building and training efforts involve setting up programs and incentives based on facts and response received from a series of TNA (Training Needs Assessment) tasks. In turn, these tasks will encourage and include a broad band of systematic training, a process which commenced with a range of workshops conducted in the two project states. The PMC interacted continuously with the management of NRRDA, the engineers of SRRDA and through visits with the PIUs, the PIC and the road contractors. These activities made it increasingly clear for all parties what areas of training are needed in the fields of preparing DPRs, planning, progress reporting, etc. plus knowledge and implementation of road contracts and related construction management.

Workshops Conducted

During the month of September 2005, three sets of DPR

Orientation Workshops were organized each in Raipur (Chhattisgarh), Bhopal (M.P.) and Jabalpur (M.P.), and conducted over a period of five days. In addition, a workshop on Construction Management was held in Indore (M.P.) on 6th & 7th October 2005. This will be followed by two more of the same module; one each in Raipur (Chhattisgarh) and Jabalpur (M.P.) with participation of representatives of PIUs, PICs and Contractor's staff.

DPR Orientation Workshops

The chief objective of DPR Orientation Workshops was to provide the staff of PIUs and PICs who are primarily associated with the development of the Subproject Proposals, a common understanding of the basic requirements of Subproject Proposals with regard to DPR Design Criteria, DPR Related Safety, Rehabilitation and Resettlement Issues, Socio-Economic, Transport Economic and Environmental Issues etc.

From the questionnaires completed by the participants, a wide range of training was identified primarily in the following six areas of concern; i.e.: (Practical) Construction Management, various disciplines of Design, Surveying, Quality Control, Planning & Reporting and Contracts.

On the basis of these results, the PMC will work with the SRRDA and NRRDA to advise on future Capacity Building and Training.

Contd. on Pg. 14.



PMC Presentation at DPR Workshop in Bhopal on 22nd September, 2005



Contd. from Pg. 11.

Construction Management Workshop

The workshop on Construction Management at Indore on 6th and 7th October aimed primarily at providing an overview of various important aspects of Construction Management such as Problems and Issues related to pre-construction, Role & Responsibilities of the Parties to the Contract i.e. the Employer, the Contractor and the Engineer in Contract Management, Quality Control and the Project Reporting.

Participants' Observations and Comments:

- i) The participants unanimously expressed their opinion that decisions regarding approval/sanction of variations in DPRs and rates for items of work outside the contract or schedule of rates need to be expedited in a time bound manner.
- ii) More discussions are necessary in understanding role, responsibilities, duties and functions of the Consultant in respect of long term problems and solutions concerning disputes, court cases, litigations, etc.
- iii) Suggestions and comments made by the participants in the workshop need to be placed before the higher authorities for their approval and action.
- iv) At least a period of six weeks be allowed as pre-construction period before the date of commencement of the work for activities such as pre-construction field level check survey and review of documents and site conditions.
- v) These type of training workshops need to be organized for the junior staff of the PIUs and PICs. The training programs should be organized at PIU's level.

- vi) A uniform and a common software needs to be used for calculation of earthwork quantities.
- vii) More detailed training in Quality Control and Testing of materials and works with modern instruments and modern construction techniques be provided.



Groupwork at Indore Workshop

These issues will be reviewed by PMC, SRRDA and NRRDA with the objective of addressing during the course of the project, through various types of training.

BHARAT NIRMAN

“My Government proposes to undertake a major plan for rebuilding rural India called **Bharat Nirman**. This will be a time-bound business plan for building rural infrastructure in the areas of irrigation, roads, housing, water supply, electrification and telecommunication connectivity. The programme has been conceptualized as a platform on which the Government would construct its new deal for rural India.”

- Address of Hon'ble President of India to Parliament on 25th February, 2005.

Pradhan Mantri Gram Sadak Yojana Under Bharat Nirman

A New Deal for Rural India

- Providing all weather connectivity to habitations of population of over 1000 (500 in Hills and Tribal Areas) by 2009.
- Task is to connect 66802 habitations.
- Work involves construction of over 1,40,000 km of new roads & upgradation of over 1,90,000 km of existing Rural Roads.
- Likely investment Rs.48,000 crores.



Revisiting "Defect Liability" in Standard Bidding Document for PMGSY

Prabha Kant Katara, Chief Quality Coordinator, NRRDA

A Standard Bidding Document has been developed for the PMGSY after studying the good procurement systems and best national and international practices. The work of development of Standard Bidding Document was given to the experts in the field. The procurement process and Standard Bidding Documents of various States, MORTH, World Bank and ADB etc. were reviewed and the development of draft documents was completed. The draft was subjected to the process of thorough review and consultation by experts and the State Governments and was prescribed for use by the Executing Agencies of the State Governments with effect from 2003-04. The Standard Bidding Documents have the following main provisions:-

- The tender is invited for construction of the road work as well as its maintenance for five years after completion.
- The technical qualification of the contractor in terms of the bidding capacity, the experience of civil engineering works in the relevant field, possession of requisite machinery and equipment and financial capacity etc. are evaluated before opening of the financial offer.
- Contractor's responsibility of establishment of Quality Control laboratory and mandatory testing, contractor required to employ requisite technical personnel.



- The funds for the construction are provided through the Pradhan Mantri Gram Sadak Yojana, however, the funds for routine maintenance for five years to be provided by the State Governments.

In order to give the effect to the provisions of Standard Bidding Documents, the following procedure is adopted for execution of works:-

- The estimate of each work under PMGSY is made in two parts. The first part, construction work and the second part, year wise routine maintenance for 5 years.

- Before submitting the proposals for Construction of Road works for clearance to the Empowered Committee of the Ministry of Rural Development, the State Government is required to approve routine maintenance.

While using the SBD, the States provide feedback in respect of various provisions. Based on the feedback, two amendments have been effected. The summary of the amendments is as under:-

- Returning 50% of the security deposit (i.e., 2.5% of the tender value) on completion of construction.
- Lays down time period for settlement of final bill.
- Specifies modified frequency of routine maintenance operations.
- Strengthens provisions in the General Conditions of Contract (GCC), pertaining to deployment of construction machinery, technical manpower and field laboratory.
- Provides for recovery of liquidated damages in case the work is terminated because of delay in execution by the Contractor.

The Standard Bidding Document provides for a defect liability period of five years coupled with routine maintenance. The Contractor is required to furnish 5% of the cost of construction as performance security and an amount equal to 5% of the running bills is retained as security, thus an amount of about 10% is available with the Employer till the completion of work, plus 5 year period of defect liability and routine maintenance. After receiving many representations from the States, an amendment was effected recently and 50% of the retention amount has been allowed to be released after completion of the construction work. Thus, there is a provision of keeping 7.5% of the cost of construction now as security for about 6 years.

The background of making this provision is given below:-

Clause 15.2 of the PMGSY Programme Guidelines issued during 2001 (now superseded by the November, 2004 Guidelines) provided for the following:-

"The roads constructed under the programme are expected to be of very high standard, requiring no major repairs for at least five (5) years after completion of construction. In order to realize this objective, suitable clauses relating to Performance Guarantee / routine maintenance shall be included in the Contract Documents, as per the provisions in the Standard Bidding Document. In particular, the State Government shall obtain a Bank Guarantee from the Contractor for 10% of the value of the



work, which should remain valid for the 5 year period and should be discharged only after consulting the Panchayati Raj Institution responsible for maintenance."

Routine maintenance is required for any road and there is nothing like a "maintenance-free Rural Road". In fact, in case of properly designed and well executed roads, expenditure on maintenance would be minimal, subject to the condition that adequate routine maintenance in the form of Preventive Action Plan is carried out. Therefore, while prescribing the SBD, it was felt that in addition to making the provision for defect liability, routine maintenance is also required, otherwise it will be difficult to segregate the defects caused because of natural wear and tear of the road and it may be difficult to implement the defect liability clause. As such, the provision for tendering the routine maintenance for five years was made in addition to defect liability. To give effect to these provisions, the items of estimated routine maintenance for each year of the five years were included in Bill of Quantities and the Contractor is required to quote the rates for maintenance also, in the same way as he is quoting rates for construction items.



PMGSY is a 100% centrally funded scheme and making compulsory provisions for maintenance and mandatory arrangement of funds by the States was not appreciated by the States in the initial period and a lot of efforts were required to convince the States for funding the routine maintenance as marginal investment to postpone costly renewals and rehabilitation. However, now because of realization of loss of assets due of lack of maintenance, the States have appreciated the initiative of the Ministry in respect of provision of five year maintenance and majority of States have provided funds. While serious thinking was going on in PMGSY regarding the importance of maintenance of

rural roads, the recommendations of the Twelfth Finance Commission also came. In fact, the States are now more comfortable in providing adequate maintenance fund because the Twelfth Finance Commission has laid necessary and welcome emphasis on maintenance, as evident from the following extracts of their report.

"It is far more important to ensure that assets already created are maintained and yield services as originally envisaged than to go on undertaking commitments for creating new assets."

"Some of the basic features of our approach and the resultant modifications may be summarized as below..... With a view to ensuring minimum level of services in the case of education and health, we consider conditional grants derived on the basis of a normative approach as relevant. A similar consideration applies to maintenance expenditures."

"While encouraging higher growth in expenditure in areas relating to education, health, maintenance of roads and We have encouraged larger expenditures on maintenance of roads and bridges providing separate additional grants as discussed in chapter 10."

"We, however, notice that maintenance of roads and buildings has not been given adequate importance by the States. We are, therefore, recommending additional grants separately for maintenance of roads and bridges, and for maintenance of buildings..... A grant of Rs.15,000 crores over the award period is recommended for maintenance of roads and bridges. The amount will be in addition to the normal expenditure which the states would be incurring on maintenance of roads and bridges."

During the discussions with the States and professionals on various occasions, it has been pointed out that though, the arrangement of five year routine maintenance can be continued, the liability of defects envisaged for a period of five years is not practical. Many States, NHAI and other organizations provide for only one year defect liability. It is a fact that the 5 year defect liability is causing problems in more ways than one:

- Given the construction standards, a 5 year defect-free guarantee for rural roads is an extremely high standard which pushes up costs and deters good contractors.
- In reality it is not easy to pinpoint whether a road failure if it happens is due to (a) a construction defect; (b) lack of maintenance, particularly of drainage systems; (c) design



defect in either drainage or crust thickness; or (d) unusually high traffic. It could be, generally, a combination of the above factors.

- The 'defect-free' conditionality is therefore suspected to be a cause for over-design by engineers and higher tender rates by Contractors.
- On the other hand, there is no viable enforcement mechanism. As a management practice, the contractor's security can be forfeited but the contractor has already factored this with his bid (and we are paying for it).
- The 'defect free' requirement cannot be a substitute for maintenance, particularly routine maintenance items like filling rain cuts in shoulders, clearing drains, etc. In fact, if maintenance is not done, liability for defect guarantee can get diluted.
- In the past, many States provide for free maintenance in their bidding documents in the guise to operationalise the 'defect-free' guarantee. This is not a practical solution as such, these States have not been able to evolve and operationalise technically sound routine maintenance systems.

The construction-cum-maintenance contract enforced with effect from 2003-04 is now in operation and has been observed to be working satisfactorily. Since paid routine maintenance is now a practical solution already being

enforced, an unworkable '5 year defect-free guarantee' may no longer be necessary. The earlier feeling that States may not be able to sustain a paid routine maintenance regime is also now dispelled, since the Twelfth Finance Commission (TFC) has given a generous award for maintenance of the road network. In fact the TFC feels that the absorption capacity for maintenance needs to be built up. Fortunately in PMGSY we have done just that over the past 2 years, by

- Having a construction-cum-maintenance contract system.
- Defining routine maintenance items in the Contractor's Bill of Quantities (BoQ).
- Specifying the periodicity of inspection of roads by PIUs to enforce maintenance.
- Working out a simple but effective visual 'Pavement Condition Index' (PCI) already operationalised in many States, to develop a Routine Maintenance Priority List (RMPL).

As such, 'maintenance' rather than 'defect liability' is what is required to be focused upon, and since the 5 year defect liability is in fact confusing the obligation of the Contractor for 5 year paid maintenance, it is necessary to revisit the idea of 5 year defect liability. The time is therefore ripe to make 'routine maintenance' rather than 'defect liability' as the cornerstone of our network management policy.

PMGSY Achieves First Quarter Outcome Budget Targets

The Ministry of Finance, during August 2005, has introduced 'Outcome Budget' as a mechanism to measure the development outcomes of all major programmes. This exercise is primarily aimed at converting financial outlays into measurable and monitorable outcomes. It is a performance measurement tool that helps in better service delivery, decision making, evaluating programme performance and results, and improving programme effectiveness. The Outcome Budget is also aimed at changing the outlook of the agencies entrusted with the responsibility of programme execution and implementation. The idea is to make the programme implementing agencies more result oriented by shifting the focus from 'outlays' to 'outcomes'.

As far as PMGSY is concerned, outcome is measurable in two dimensions, number of habitations covered and length of road work completed during the year. The targeted annual outcome in each of these dimensions has to be further disaggregated into quarterly targets for the purpose of monitoring.

Targets for first quarter & achievement:

	Targets	Achievements
Habitations (in number)	2220	2612
Road length (in km)	4995	6927

All the States have been intimated about their annual targets and asked to gear up for achieving the laid down targets, not only in financial terms, but also the physical outcomes.

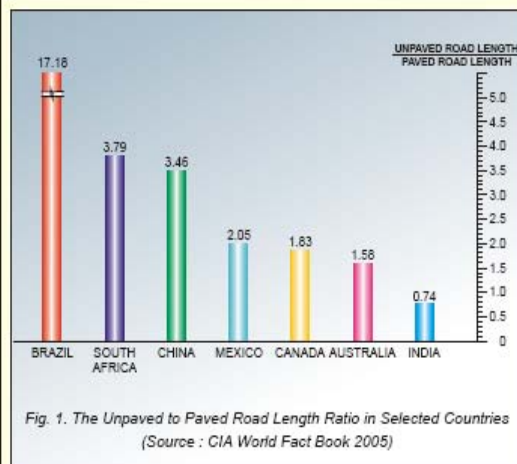


Relevance of Gravel Roads In Rural India

Dr. L.R. Kadiyali, Consulting Engineer and Dr. N.B. Lai

International Experiences With Gravel Roads

It is well known that a bulk of the world's total road network comprising low traffic volume roads is unpaved (Gravel roads are virtually always referred to as unpaved roads) (Ref. 1). The ratio of unpaved to paved road length in seven selected countries, including India, are shown in Fig 1. As may be seen in Fig 1, rapidly developing large countries like China, South Africa, Canada and Australia have an unpaved road length much longer than the paved road length. In India, however, the unpaved road length is even less than the paved road length. Even in a highly developed large country like USA, the unpaved road length is more than double the unpaved road length in India.



While pursuing its gigantic programme of providing connectivity, by all-weather roads, to the large number of the yet unconnected habitations within a foreseeable future, India can benefit a great deal from international experiences with gravel roads. Keeping the various techno-socio-economic considerations in view, there appears to be a strong case for the very low traffic volume link roads, to be gravel-surfaced atleast in the first stage of their development. The rising cost of bitumen makes the case for gravel surfaced roads even stronger for the very low volume rural roads in India, atleast in the first stage of their development.

Techno-socio-economic Aspects

The choice of surface type for a low-volume rural road will obviously depend, on (i) the design traffic expected to ply during a single performance period, expressed in terms of Equivalent Single Axle Load (80 KN) applications (ii)

minimum acceptable level of serviceability or allowable serviceability loss or (iii) allowable depth of rutting. As per AASHTO (Ref 2) for gravel roads, "the maximum traffic level considered is 100,000 applications/repetitions of 80 KN ESAL, while the practical minimum level during a single performance period is 10,000". It is also stated (Ref 3) that "the practical minimum traffic level that should be considered for any flexible or rigid pavement during a given performance period is about 50,000 heavy vehicles (trucks and buses) over its design life in the design traffic lane". Considering a single performance period of 5 years, (when a black-topped road generally requires surface renewal and a gravel road requires regravelling) and a uniform traffic growth rate of 6%, the cumulative 50,000 ESAL applications workout to an initial ADT of about 200, typically comprising 10 heavy trucks/buses (HCVs) and 40 medium-heavy commercial vehicles (MCVs) like tractor-trailers plying per day in the year of opening to traffic, besides the non-motorized and the light motorized vehicles. As per AASHTO (Refs 2,3) any initial traffic less than the above, does not justify a black-topped or a concrete road and should, therefore, be only a gravel-surfaced road. Also, a gravel road can take upto a maximum of 1,00,000 ESAL applications typically comprising 20 heavy trucks/buses (HCVs) and 80 medium-heavy commercial vehicles (MCVs) like tractor-trailers (besides the non-motorized and the light motorized vehicles) plying per day in the year of opening to traffic for a



period of 5 years, assuming a uniform traffic growth rate of 6%. It may be observed from the above levels of traffic that most of the rural roads in India need only be gravel-surfaced.

It may be noted that the social benefits derived by beneficiary rural communities from a gravel road, in terms of improved educational, health and other facilities as well as improved employment opportunities etc are practically same as derived from black-topped or concrete roads.



For a typical low volume rural road project, a rigorous economic analysis yields an IRR of the order of 18% to 20%, as against only 4% to 5% for a conventional black-topped road. However, if a stage development approach is adopted, the IRR works out to an acceptable 11% to 12%.

Materials

Gravel has been defined (Ref 1) as "a mix of stone, sand and fine-sized particles used as sub-base, base or surfacing on a road". The gradation and plasticity requirements for use in sub-base, base and in surfacing are provided in the MoRD Specifications for Rural Roads (Ref 4). Generally, a good road gravel should have about 50% to 70% of gravel size and 25% to 40% of sand size material (Ref 5). The percent fines (silt



and clay) for use in base courses should never exceed 10%, the desirable maximum being 5%, while for surfacing, a range of 9% to 16% is required.

In regions, where the naturally occurring gravels meet the specified requirements of gradation and plasticity, the same can be used as such; in other regions, blending of different locally available materials can be resorted to in the proportions required for meeting the gradation and plasticity requirements. For example, if a particular source of gravel/moorum has excessive fines (i.e. silt and clay), it is always possible to blend a local sand to decrease the percent fines. On the other hand, if a gravel/moorum source has too little of fines, it is possible to blend a binder soil to achieve the required gradation and plasticity requirements. "On account of cost considerations, the granular materials most commonly used are the natural sands and gravels, but crushed stone or slag or stone screenings are equally suitable" (Ref 5).

Design

Extensive data has been collected on the performance of gravel roads in different parts of the world, notably in the

USA. Design charts have been developed by AASHTO (Ref 2) considering (i) serviceability loss and (ii) allowable depth of rutting. In India, the Rural Road Pavement Performance Study, recently initiated by the NRRDA would go a long way in providing further performance data specific to different climatic zones in the country.

Construction

The various construction operations specific to the mechanical stabilization technique to be adopted for gravel road construction and the related equipment/plant requirements are:

- Placing of material on the prepared road-bed from spreader boxes or from vehicles especially equipped to distribute the material in a uniform layer.
- When additional material is to be blended with the material on the road, the blending material should be uniformly placed with spreader boxes.
- Mixing and spreading should be carried out by a tractor-towed 'Rotavator', developed in India.
- Compaction by a power roller at optimum moisture content.
- Checking the surface requirements by a Camber Board/3m Straight edge.

There appears to be a clear case for evolving simple, inexpensive appropriate technology for gravel road construction utilizing to the extent possible, the agricultural tractor as the prime mover and working out an optimal man-machine mix. If proper control on the quality of gravel is exercised and proper construction procedures are adopted, a good riding surface is achievable as shown in Fig 2.



Fig 2. A Finished Gravel Road With Good Riding Quality



Maintenance

The routine and periodic maintenance measures for a gravel road include the following:

- Making up the loss of profile, using a mechanical grader.
- Improving the gravel road surface by dragging with use of a tractor-towed 'Drag'.



- Rectifying corrugated surface by grading with a mechanical grader or by using a tractor-towed 'Drag'.
- Filling up local depressions, ruts, potholes and erosion gullies, using hand tools.
- Regraveling.

Here again, it is not only desirable, but necessary that appropriate technology for gravel road maintenance be evolved wherein the agricultural tractor is utilized as a prime mover and local communities provided with gainful employment opportunities to the extent possible.



Concluding Remarks

Whether a rural road should be paved or unpaved or left unpaved in the first stage of its development, to be paved later, must be arrived at scientifically. First and foremost is the essential requirement of carefully estimating the design traffic parameter over a single performance period, in terms of Equivalent Single Axle Load (80 kN) applications. Till such time as we develop our own norms for deciding the surface type, it will be prudent to adopt the norms developed abroad, notably in the USA and in Australia.



A comprehensive Manual on Gravel Roads should be brought out for the benefit of Rural Road Engineers covering, in detail, the aspects of Materials, Design, Construction including Stage Construction, Drainage, Maintenance and Rehabilitation.

Full-scale field demonstration of Gravel Road Construction and Maintenance should be arranged in selected regions of the country to promote confidence among Rural Road Engineers and Users. Efforts appear warranted towards evolving appropriate technologies of construction and maintenance of gravel roads highlighting use of tractor-towed equipment.

Specially designed training programmes need to be organized for junior engineers, supervisors, plant operators, skilled and unskilled workers.

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PMGSY DO's and DON'T's in Quality

Prabha Kant Katare, Chief Quality Coordinator, NRRDA

In earlier issues, the dos and don'ts in quality of PMGSY roads were discussed for Setting out, Site Clearance, Embankment, Earth Work, Granular Sub-base construction and Water Bound Macadam (WBM) as Base/ Sub-base course. In this issue, dos and don'ts pertaining to preparation of surface for receiving bituminous construction and Prime Coat is covered.

PREPARATION OF SURFACE (GRANULAR BASE LAYER)

STEPS

- The purpose of preparation of surface for receiving bituminous construction is to ensure proper bound between bituminous course and granular base course. If granular base course is loose or dusty, there would be no bound between the two layers.

- Generally WBM Base Course is being constructed under PMGSY. In many States crushable aggregate is being used in WBM construction and because of nature and quality of crushable aggregate available in most parts of the country, specific attention is required in respect of cleaning the existing granular surface.
- If the bituminous layer is required to be laid on WBM, proper wire brushes or mechanical brooms should be used to remove the loose particles, clayey substances or other foreign matter. After thorough cleaning, air jets of mechanical blowers must be used to blow out the dust or other loose particles.
- The surface so obtained has to be correct to lines, level and cross slope, within the specified tolerances.

Dos and Don'ts

Dos	Don'ts
<ul style="list-style-type: none"> Clearly mark the area for cleaning based on arrangements for laying Prime/Tack Coat. 	<ul style="list-style-type: none"> Don't prepare the surface which cannot be covered by Prime/Tack Coat in reasonable time limit and which should be calculated on the basis of weather and the traffic likely to move.
<ul style="list-style-type: none"> Wire brushes or mechanical broom must be used to loosen plastic clays or foreign matter. 	<ul style="list-style-type: none"> Don't use some non standard indigenous method to loosen/clean the WBM surface.
<ul style="list-style-type: none"> Once the loosening and course cleaning of undesirable substance is carried out by wire brushes or brooms, thorough removal of dust is a must. 	<ul style="list-style-type: none"> Don't use only gunny bags for blowing the dust; it does not remove the dust from the exposed joints between the metal pieces.
<ul style="list-style-type: none"> Care should be taken not to disturb the interlocked aggregates yet the surface should be cleaned in such a way that about a 10-20mm groove is created at the joint between two pieces of metal. 	<ul style="list-style-type: none"> Don't shed significant quantities of material otherwise the WBM surface will become loose.





Dos and Don'ts

PRIME COAT OVER GRANULAR BASE

STEPS

- Select bituminous primer based on porosity characteristics of the surface of Granular Base.
- The Granular Base should be swept clean of dust and loose particles but care should be taken not to disturb the inter-locked aggregates.
- The bituminous primer should be a slow-setting emulsion, however, the cutback may be used in areas having subzero temperature.
- Use mechanical sprayer capable of spraying primer at specified rate and temperature.

- The application should be such that a uniformly unbroken spread of primer is created over the dry surface of base course.
- Normal temperature range of spraying emulsion should be 20°C to 60°C and rate of application will depend on type of surface to be timed. In case of WBM, the rate of application of emulsion is 7 to 10 kg per 10 sqm.
- A very thin layer of sand may be applied to the surface of the primer to prevent it sticking to the wheels of vehicles used during construction.
- The surface should be allowed to cure for 24 hrs and sand may be spread over portions found uncured.

Dos	Don'ts
<ul style="list-style-type: none"> ▪ Use mechanical sprayer for application of primer. In narrow strips etc. pressure hand sprayer may be used. 	<ul style="list-style-type: none"> ▪ Don't use perforated cans for spraying primer in any case.
<ul style="list-style-type: none"> ▪ Uniform unbroken spread of primer must be ensured. 	<ul style="list-style-type: none"> ▪ Avoid overpriming as well as hungry spots.
<ul style="list-style-type: none"> ▪ If surface to be primed is as dry or dusty as to cost freckling of bituminous material, surface can be lightly and uniformly sprinkled with water prior to priming but at the time of application of primer no surface water should be visible. 	<ul style="list-style-type: none"> ▪ Don't apply primer on dusty or wet surface.
<ul style="list-style-type: none"> ▪ The spraying temperature of the emulsion primer shall be 20°C to 60°C. 	<ul style="list-style-type: none"> ▪ Don't heat up primer beyond desired temperature as it has to be just hot enough to permit the primer to be effectively sprayed through jets of the spray bar.
<ul style="list-style-type: none"> ▪ The primed surface should be cured for at least 24 hrs or such other period found to be necessary to allow all the volatiles to evaporate. 	<ul style="list-style-type: none"> ▪ Don't allow traffic during curing period.
<ul style="list-style-type: none"> ▪ A very thin layer of sand may be applied to the surface of the primer to prevent it sticking to the wheels of vehicles used during construction. 	<ul style="list-style-type: none"> ▪ Don't dump too much sand to allow the traffic.



General Body Meeting of NRRDA on 1st September 2005



The 4th Meeting of the General Body of the NRRDA was held on 1st September 2005 in the office of NRRDA. The Annual Action Plan 2005-06 was reviewed, Annual Report for the year 2004-05 was approved and audited account was adopted. The General Body also approved launching of Rural Roads pavements performance study and rules for honorarium and T.A. for non NRRDA personnel. The Hon. Minister, Shri Raghuvansh Prasad Singh, addressed the GB and said that Rural Roads have received special attention under Bharat Nirman. All efforts would be made to achieve the target of connecting all habitations with 1000+ population, 500+ in hilly states by 2009. He directed that there should be complete transparency in the programme at every stage. He mentioned that "Grameen Sampark" is a good way of disseminating information about PMGSY and should be given regularly to all concerned. He also emphasized the need to finalise the Vision Document at an early date.