Grameen Sampark

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In this Issue

Pradhan Mantri Gram Sadak Yojana

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

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Editorial

It is too early to say if Grameena Sampark has established itself in terms of its sustainability. The primary purpose of the Newsletter is to inform stakeholders and hopefully, the casual but interested readers of the new energy that is getting infused into the rural roads sector, but whether that energy is sufficient to get enough people to pick up a pen and paper (or a computer keyboard) and dash off an article once in a while, is still to be seen. I suspect that the neglect of the rural roads sector goes beyond technical and management standards, both of which are being addressed through the PMGSY. It would seem that debate and discussion on policies for rural roads (which perhaps would also manifest itself in contributions to Grameena Sampark!) are only now restarting, as a result of the PMGSY intervention. By treating rural roads construction as a mere employment generation strategy rather than as a rural access facility, perhaps many important policy related issues of a long term nature have remained unstated for far too long.

The intervention through PMGSY, of the Ministry of Rural Development (and its technical agency the NRRDA) in what is essentially a State subject has proven justified with the development of high and uniform technical and management standards for the sector, and it is inevitable that this role will now extend towards building partnerships with State Government and other stakeholders to jointly develop a common vision on the direction that the rural road sectoral development should take. While the development of a 20-year Vision Document for the rural roads sector would itself be a major achievement, to my mind, the process is as important as the goal. Discussions with State Governments and other stakeholders will stimulate thinking on matters requiring resolution, include socio-economic issues as well as technical issues (and most difficult, issues which including technical as well as socio-economic elements), and will help develop a more realistic, desirable and implementable set of policies at State, as well as Central level.

This Issue includes an article on the progress in development of the Vision. Hopefully by the time the next issue comes out, the Vision Document itself should have been published and the next issue will of course carry the highlights.

(S Vijay Kumar)
Director-General, NRRDA

Rural Roads Development Plan: Vision 2025

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

Background

Government, as a part of its Poverty Reduction Strategy launched a major Rural Roads Connectivity Programme "Pradhan Mantri Gram Sadak Yojana (PMGSY)" in December 2000. During the implementation of this programme, several new initiatives taken by the Ministry of Rural Development, are expected to lead to overall Sectoral Development, including development of specifications, procurement and management standards etc. Expanding on these initiatives, the Ministry decided to prepare a Vision Document for the development of Rural Roads in India on similar lines of Vision 2021 for Highways brought out by Indian Roads Congress (IRC) on behalf of the Ministry of Road Transport & Highways (MoRT&H). The IRC has accepted the responsibility of developing the Document and has constituted an Expert Group with Shri. D.P. Gupta, former DG, MoRT&H as Convener alongwith Dr. L.R. Kadiyali and Shri. P.K. Lauria as Members.

Consultative Process for the Development of Vision 2025

The Expert Group appointed for the development of the Document came out with a lead paper outlining the content of the Document and presented it in the 173rd Council Meeting of IRC held on 9th January 2005 at Bangalore, for getting the views and opinions of the Highways Engineers across the country. This was followed by a Workshop on 'Integrated Development of Rural and Arterial Road Network : Rural Roads Vision 2025' organized jointly by IRC and NRRDA during 25th-27th February 2005 at Vigyan Bhawan, New Delhi.

Based on the inputs from the above Workshop, the Expert Group has fine-tuned the broad outline content of the proposed document and developed a Questionnaire for collecting data on Rural Roads Sector from the States. The States were also asked to give information on the following issues:

- Investment patterns in Rural Roads Sector.
- Employment Generation in Rural Road Construction.
- Rural Transportation Systems.
- Construction Technologies adopted.
- Land Acquisition Policy.
- Norms followed for Rural Roads.
- Maintenance Policy.
- Role of Gram/Block/Zilla Panchayats.
- Technical Support available to PRIs.
- Status of Rural Roads Constructed under employment schemes.
- Status of Contracting Industry.
- Government - Academicia partnership
- Incorporation of rural roads network concepts in rural development planning.

While data from more than 25 States has been received for analysis, the same is shortly expected from the rest of the States.

MoRD has constituted a Committee for Rural Roads Development Plan Vision 2025 with JS (RC) & DG, NRRDA as Convener and Secretary and IRC as a Member Secretary of the Committee. The Members are drawn from different organizations connected with road transport, Representatives from the States dealing with Rural Roads, Representatives of Consulting Firms, NGOs, NCAER, Ministry of Panchayati Raj and two Corresponding Members from Academicia.

As a follow up action and also in order to discuss further details about the scope and content on the Vision Document, a second Workshop was organized by NRRDA on 30th April 2005 at Vigyan Bhawan, New Delhi with participation of the Members of the Committee constituted by the Ministry of Rural Development.

Shri. D.P. Gupta, Convener of the Expert Group made a presentation on the proposed Document and stressed the need for reliable data base in order to develop the Vision Document for assessing the needs and impacts. Several useful suggestions put forward by the Delegates will be considered in the development of the Vision Document. Suggestions covered the role and impact of Rural Roads, generations of alternative Planning scenarios, adoption of integrated rural accessibility planning, need for cost effective construction with the use of local materials, development of need-based designs, issues in land acquisition and appropriate legislation to avoid litigation, use of appropriate technology, stage construction, quality assurance, rural roads safety etc. It was also highlighted that development of Rural Roads needs to be linked to Millennium Development Goals (MDGs) at local and global level. The delegates stressed the need for coordination among different agencies and programmes and the steps to be taken for Asset Management. It is further highlighted that Rural Roads should be viewed as a 'means' rather than the 'end' in any employment generation strategy.

It was suggested that the Vision Document should clearly give a word of caution on the depletion of natural resources and the need for appropriate policies in the construction technology. Another important issue that came to light is the role of Panchayati Raj Institutions (PRIs) and ways and means of community participation in asset creation and management, with necessary capacity building. It was suggested that the document should clearly bring out the policies on resource mobilization and fiscal planning. The deliberations also pointed out the need for identifying key Transport Indicators for Bench Marking and Evaluation of the Rural Roads Sectoral Programmes.

The Current Status

The Expert Committee has prepared and circulated a Draft Vision Document incorporating the suggestions and views from the two workshops held earlier and the data base received from the States. This document was discussed by the Steering Committee appointed by IRC and later in the 175th Council Meeting of IRC held on 22nd May 2005 at Shillong. More suggestions for fine-tuning and finalizing the document have been received from the Members.

The Expert Committee is expected to submit the Draft of the Final Report of the Vision Document by 15th June 2005. IRC will finalize the document after approval by the Ministry of Rural Development and publish the approved version of the Rural Roads Development Plan: Vision-2025 by middle of July 2005.

PMGSY in Parliament

The second half of a Budget Session is never the same as the first half. For one, the excitement and anticipation of the President's Address and the Budget Speech which mark the opening of the Session are over. Also, Members have generally been able to ask their Questions or raise their constituency related matters under Special Mention (Rajya Sabha) or Rule 377 (Lok Sabha).

But perhaps, equally, the Budget break, when the Department related Parliamentary Standing Committees get down to their business of scrutinising the Demands for Grants of the various Ministries and preparing their Reports to be tabled in Parliament as soon as the Session recommences, serves to focus Members attention to the larger issues of Government's accountability to Parliament. The second half of the Budget session therefore sees more debates on the working of selected Ministries as well as on the Finance Bill, not to mention on pending legislation.

The Department related Parliamentary Standing Committee on Rural Development, met on 29th March 2005 under the chairmanship of Shri Kalyan Singh to hear the Secretary of the Department, Shri M Shankar. Having circulated a preliminary Questionnaire and considered its reply, the Committee focussed on the material provided by the Ministry to its supplementary questionnaire. In so far as PMGSY was concerned, the Committee's focus was on the main issues of the programme, capacity development in the States, quality, maintenance and finding ways and means to bridge the resource gap. In its Report presented to Parliament on 19th April 2005 the Committee's main recommendations in respect of PMGSY are:-

- Inadequate financial resources is the biggest concern. More efforts need to be made to explore the potential for augmenting available resources with external funding.
- It is strongly recommended that the Central Road Fund Act be amended to enable the Government to leverage long term funds from the domestic capital market.
- Although there is an elaborate system for maintenance of roads constructed under PMGSY, there is an urgent need to ensure that State Governments adhere to these provisions.
- Details of PMGSY projects should be put up on the website for the purpose of bringing transparency in the implementation of the programme.

During the second half of the Budget session which commenced on 18th April 2005, there were a total of 17 unstarred questions (questions for written answer) in the Lok Sabha, and 2 starred questions and 8 unstarred questions in the Rajya Sabha.

On 20th April 2005 Smt. Kumkum Rai asked a starred question in the Rajya Sabha regarding funds required for PMGSY and how the Government proposes to meet the shortfall. The Minister of Rural Development, Dr. Raghuvansh Prasad Singh, in his reply stated that the requirement of additional funds would be met inter-alia from the continuing flow of diesel cess as well as borrowings from ADB, World Bank etc. On 27th April 2005, Shri Moti Lal Vora and Smt. Prema Cariappa asked another starred question in the Rajya Sabha regarding the connectivity provided under PMGSY in the last 3 years.

On 4th May 2005, there was another starred question in the Rajya Sabha, by Dr. Prabha Thakur, who wanted to know whether all villages with population of 500 or more (250 or more for desert and tribal areas) would get road connectivity by 2007. The Minister of Rural Development, Dr. Raghuvansh Prasad Singh, in his reply stated that under the Bharat Nirman programme announced in the Budget Speech of 2005-06, the rural road component has a goal of providing connectivity to all villages with a population of 1000 (500 in the case of hilly and tribal areas) by the year 2009.

Comparatively, there was a large number of unstarred questions, mostly state specific. In the Rajya Sabha, Shri S S Ahluwalia on 20th April 2005 asked to know details about PMGSY in Jharkhand including details of measures initiated to impart training to the field engineers in road design and construction and updating the data in OMMS. Shri E M Sudarshana Natchiappan on the same day had a general question on PMGSY, including the steps taken by Government to maintain quality. In her reply, Minister of State in the Ministry of Rural Development, Smt. Suryakanta Patil, gave details of the 3-tier quality control system implemented under PMGSY, and stated that where a work is found unsatisfactory, necessary rectification is to be done, and in case of unsatisfactory completed work, action is to be taken against the contractor at fault.

There were a number of unstarred questions for answer on 27th April 2005. Shri S Anbalagan wanted to know the allocation under PMGSY for Tamil Nadu and the time frame for the programme. In another unstarred question, Shri Vijay J Darda wanted to know whether State Governments are utilising the funds and laying the roads of requisite standards. Shri Dara Singh Chauhan wanted to know about the villages benefited by PMGSY in Uttaranchal. Shri E M Sudarsana Natchiappan, in addition to his earlier question, asked another question, on agencies involved in construction of roads under PMGSY, and allocation / utilisation of funds. Shri Nand Kishore Yadav's question was a more general one, on road connectivity to villages. Shri Suresh Bhardwaj asked a question about details of roads sanctioned during 2004-05 and 2005-06 in Himachal Pradesh. On 4th May 2005 Shri Marjani Lal Mandal asked a question on the progress of PMGSY in Bihar, and he was informed that the Government of Bihar has engaged five executing agencies for implementation of PMGSY in the State, since progress of works of Phase I & II were hampered by constrains of executional capacity.

On 11th May 05, Shri Dara Singh Chauhan had a question regarding proposals for 2004-05 from Himachal Pradesh, Uttar Pradesh and Madhya Pradesh. On the same day, Shri Jayanti Lal Barot and Dr. Narayan Singh Nanaklao had a question on PMGSY roadworks pending completion in Gujarat.

In the Lok Sabha, surprisingly there were no starred questions for oral answer in the second half of the Budget session. There were, however, 7 unstarred questions for answer in Lok Sabha on 29th April 2005. Shri Bikram Keshari Deo had a question on PMGSY proposals from Orissa. Shri Dushyant Singh had a question on steps being taken by Government to sanction additional funds to States where work is pending and Minister of State in the Ministry of Rural Development, Smt. Suryakanta Patil replied that the Finance Ministry has been requested to impress upon the ADB to club its second loan of $400m and third loan of $350m together, and also to expedite a second World Bank loan of $500m. Shri Chaudhary Lal Singh wanted to know details of Core Networks in Jammu & Kashmir, to which a reply was given that State Governments are requested to place these details in the programme website www.pmgsyonline.nic.in. Dr K Dhanaraju asked a general question on PMGSY proposals during 2005-06, while Shri Badiga Ramakrishna had a question on the role of State Governments in PMGSY, to which the Minister of State in the Ministry of Rural Development, Smt. Suryankanta Patil replied that State Governments are responsible for implementation of the programme, including planning, selection of road works, construction management, supervision, monitoring, quality assurance and subsequent maintenance of the constructed assets. Shri Ravi Prakash Verma asked a question regarding Phase IV proposals of Uttar Pradesh, to which a reply was given that the State Government was required to comply with certain procedural requirements including adoption of on-line works accounting system before clearance could be issued.

On 6th May 2005 again, there were 7 unstarred questions in the Lok Sabha on PMGSY. Shri Abdul Rashid Shaheen wanted to know if Government had conducted any survey on the socio-economic impact of the PMGSY on the lives of rural people, and he was informed that the Ministry of Rural Development had commissioned an independent study in 10 States on a sample basis. Shri M K Subba, wanted to know about the ADB Loan for Rural Roads in Assam, while Shri Ganesh Singh asked a question about special proposals under PMGSY. He was informed that PMGSY provides for meeting the requirements of Special Problem Areas affected by left wing extremism, backward Districts and R&D projects. Shri Vikrambhai Arjanbhai Madam and Shri Badiga Ramakrishna wanted to know whether Government was allocating funds under PMGSY for upgradation of roads, as did Shri A Sai Prathap. They were informed that till new connectivity is completed in a State, not more than 20% of the State's allocation under PMGSY could be spent on upgradation. However, Through Routes associated with new connectivity could be taken up if they are in poor condition and the roads are at least six years old. Dr. Arun Kumar Sarma asked a detailed question on PMGSY in Assam and wanted to know whether consideration of MP's recommendation is mandatory. Giving the information, Smt. Suryankanta Patil, Minister of State in the Ministry of Rural Development, also informed him that MPs are consulted and while preparing the annual proposals for road works the proposals of MPs are to be given full consideration, with the District Panchayat recording the reason in each case of non-inclusion.

On 13th May 2005, the last day of the Budget session, there were 3 unstarred questions in the Lok Sabha. Shri Suresh Chandel wanted to know details of proposals sanctioned in respect of Himachal Pradesh. Shri Ganesh Singh asked if Government was contemplating approving construction of bridges. He was informed that since rural roads was a State subject, and PMGSY is a specific central intervention, it does not provide for construction of bridges across rivers in isolation. Shri Subhash Suresh Chandra Deshmukh wanted to know about the changes in the Guidelines in PMGSY. Minister of State in the Ministry of Rural Development, Smt. Suryakanta Patil, informed him of the main changes incorporated in the new Consolidated Guidelines on PMGSY issued on 1st November 2004.

The Ministry of Rural Development was one of the 4 Ministries selected for discussion in the Lok Sabha during the Budget Session. The discussions was held on 25th April, 2005 and initiated by Shri Nikhilananda Sar. There were 20 speakers in all. PMGSY came in for mention several times, in the Speeches of Shri L Rajgopal, Shri Shailendra Kumar, Shri Sita Ram Singh, Shri Ilyas Azmi, Shri Anant Girdhe, Smt. P Sathee Devi, Shri Bapu Hari Chaure, Shri M Shivanna and Shri Nikhil Kumar. The Minister of Rural Development, Dr. Raghuvansh Prasad Singh, in his reply mentioned that a hike of 71% had been made in the allocation for PMGSY, and that international funding from ADB and World Bank was also being sourced. Following the debate, all the cut motions were negatived and the Demand for Grants relating to the Ministry of Rural Development was voted in full.

All in all PMGSY came out rather well from the Budget Session 2005:- it was included as one of the 6 components of the Government's Bharat Nirman programme; there was a 70% step-up in the Budget outlay for the programme, and in both the Lok Sabha discussions and in the Report of the Department related Committee, the main features of the programme: proper planning, good engineering inputs, attention to quality and post-construction maintenance got due appreciation. *Editor*

Better preventive and curative health care facilities within reach

Rural Roads and Bharat Nirman

Rural infrastructure development is high on Government's priority, as evidenced from the President's Address to Parliament on 25th February 2005, when he spoke of 'Bharat Nirman' as a business plan for rebuilding rural India. This theme was further elaborated by the Finance Minister in his Budget Speech to Parliament on 28th February 2005, when he identified the six components of Bharat Nirman:- drinking water, minor irrigation, rural housing, rural roads, communications and rural electrification. In so far as rural roads is concerned, Bharat Nirman goals envisage providing connectivity to all habitations of 1000 and above (500 and above in the case of Hill States including North East, Tribal and Desert Areas) by 2009. This is a restatement of the original PMGSY goals announced on 15th August 2000, which could not be met by the original target year of 2003 due to funding constraints. The 'business plan' mentioned in the context of Bharat Nirman is expected to concentrate on finding ways and means of meeting the funding gap.

It is estimated that about Rs. 48,000 crore will be required to meet Bharat Nirman goals, as given below:-

(Rs. in crore)

	Upto 2003-04	Bharat Nirman (Phase I-A) 2004-10	Phase I-B (upto end of 11th Plan)	Phase II (beyond 11th Plan)
(i) NC 1000+, 500+ habs.	12611			
(ii) NC to balance habs. of 1000+ in all States		21551	NA	NA
(iii) NC to balance eligible habs. of 500+		10672*	NA	13678
(iv) NC 250+ habs.		NA	NA	10942*
(v) CN Modernisation		13000	13006	30392
(vi) Capacity Development & QM		2013	1537	2750
Total	12611	47236	14543	57762

(NC New Connectivity, CN Core Network) * Hill & NE States, Desert & Tribal areas only

Taking into account the funds in sight on account of the accruals of cess on HS Diesel (@ Rs. 1.50/litre) and through 3ADB loans and 2 World Bank loans already in the pipeline, a net funding gap of Rs. 17,835 crore needs to be met if Bharat Nirman goals are to be met, as given below:-

	9th Plan 1997-2002	10th Plan 2002-07	11th Plan upto 2009-10	Remaining years (2010-12)	Total (Rs. in crore)	
					Bharat Nirman upto 2009-10	End 11th Plan
Cess	5000	14582	12180	8820	31762	40582
WB / ADB	-	2050	8200	-	10250	10250
Funding Gap					17835	23558
Total	5000	16632	20380	8820	59847*	74390

(*comprises Rs. 12611 crore for projects upto 2003-04 and Rs. 47236 crore for 2004-10)

Government had set up a National Committee on Rural Infrastructure on 21.10.2004 under the chairmanship of the Prime Minister, with Ministers of Agriculture, Road Transport, Power, Rural Development, Water Resources, Panchayati Raj, Communications & IT, Non-Conventional Energy Sources and Deputy Chairman and 4 Members of the Planning Commission as Members, with the objective of improving Rural Infrastructure in a time-bound manner through initiating policies, effecting internal prioritisation and developing innovative financing arrangements. This Committee is likely to drive the Bharat Nirman process. In the context of rural roads where, over the last 4 years, as a result of the PMGSY, policies are in place, management systems have been build up and the programme is ripe for take off, the issue is primarily one of finding additional financial resources.

It is likely that the strategy for meeting the funding gap will include substantial external funding through ADB / World Bank, both of whom already have ongoing projects under PMGSY covering 9 major States (MP and Chhattisgarh in ADB-I ($400 m); Rajasthan, Jharkhand, HP and UP in WB-I ($399.5 m); and Assam, Orissa and West Bengal in ADB-II (under negotiation, tentatively $500 m). It is expected that additional funding under Bharat Nirman would be required for some of these States, primarily for Jharkhand, UP, MP, Chhattisgarh, Orissa and West Bengal, as well as for Bihar, Uttaranchal and J&K.

To meet the developmental aspirations of other States who will be primarily dependent on the diesel cess for funding upgradation / renewals, a proposal is on the anvil to amend the Central Road Fund Act in order to enable these States to leverage their share of the cess to borrow funds in the domestic capital market. This is likely to subserve the National Common Minimum Programme objective which speaks of 'modernising' as well as 'augmenting' rural infrastructure including roads.

Editor

A Geographical Information System for PMGSY

Sushant Baliga, Director (Projects II), NRRDA

A Geographical System for PMGSY and other Rural Roads

The NRRDA has established an On-line Monitoring and Management System (OMMAS) to effectively monitor and manage various activities under PMGSY. The OMMAS was developed with the assistance of the Centre for Advanced Computing, Pune (C-DAC). The system can be accessed through internet (www.pmgsyonline.nic.in). The database for the system is established at various District Project Implementation Units in each state and is being updated regularly. The database includes information on connectivity status of habitations, District Rural Road Network, Core Network, proposals made for each batch of works, works sanctioned, Contractors' details, physical and financial progress, unit costs, quality monitoring, Pavement Condition Index etc.

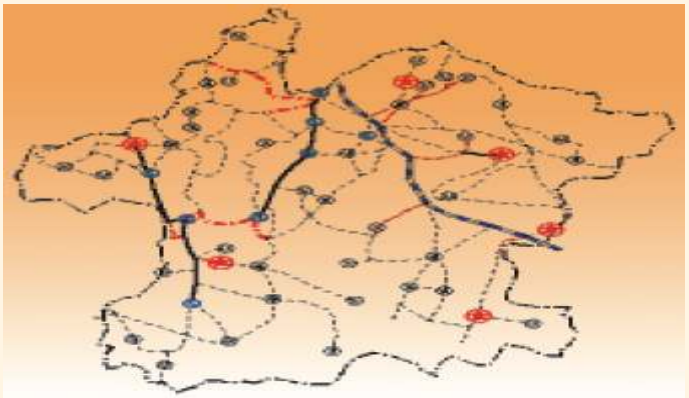
The NRRDA has decided to take lead to further consolidate and expand these efforts by establishing a comprehensive spatial database for the rural roads. This will be done through establishing a computerized database at state level for management of various construction and maintenance programs, adequately modifying the database of OMMAS, and linking these to a Geographical Information System. The system will promote a higher level of monitoring, rational decision-making, for PMGSY as well as for various rural roads programmes for construction and maintenance of rural roads to be implemented by various rural roads organizations. A project has been taken up with the states of Rajasthan and Himachal Pradesh on a pilot scale covering three districts. Subsequently, NRRDA plans to scale-up the system to other districts/states based on the experiences gained from the pilot.

The system has to meet the requirements of PMGSY as well as other rural roads programs being implemented in the states. The GIS interface is to be developed as

- Stand alone for the use of PIUs at their office to perform various analyses and produce management reports for their day-to-day use
- Web-based for use in public domain as a seamless extension of OMMAS

The main goal of the pilot project is to develop and make operational, a computerized spatial database for rural roads in GIS environment, for effective management of PMGSY and various state level programmes from construction, improvement, and maintenance of rural roads in the states of Rajasthan and Himachal Pradesh. In future it is envisaged that the GIS would enable better planning of other infrastructure projects which can be taken up in a road-centric manner, as connectivity would provide greater synergy. It is envisaged that with time, better location planning of socio-economic rural services would be enabled with the use of a rural road GIS.

The main source of the spatial data would be Survey of India maps at 1:50,000 or larger scale, and block maps already prepared by various states showing the DRRP/core rural roads network and other roads/tracks, and maps available with the road agencies showing roads of different categories and location of the quarries for road



building materials. The spatial data-base will include but not be limited to, (i) administrative boundaries at the state, district, and block level, (ii) forest boundaries and major land use, (iii) all habitations, towns and cities, (iv) all roads including national highways, state highways, major district roads, rural roads (PMSGY and non-PMGSY), tracks and paths as available from the Survey of India or other maps, (v) rivers and major streams, (vi) bridges, culverts, and other drainage structures on the rural roads, and (vii) location of the quarries for road building materials.

The spatial and attribute data shall be linked with the OMMAS in order that the spectrum of information available on-line could be mapped spatially for a seamless graphic output which could be easily assimilated. The integrated system would enable inter-alia:

- Linking OMMAS data with maps
- Addressing basic and advanced spatial queries
- Generating overlays and text reports based on the queries
- Answer queries on Master data
- Monitoring physical and financial progress
- Generating reports on quality aspects
- Generating road status reports
- Querying on habitations connectivity
- Updating spatial and non-spatial database
- Generating road condition reports
- Reviewing maintenance aspects and maintenance plans
- Generating management reports as required by NRRDA and the states

A conscious decision was made to close-couple OMMAS and GIS as this would ensure sustainability of the spatial database. Often GIS systems fall into disuse due to obsolete associated databases. OMMAS is to be updated mandatorily and thus the spatial data would also automatically display the latest information. The web-based GIS system would carry forward the transparency of the Programme by dissemination of information relating to programme status in spatial format, which would be user-friendly and usable by persons without detailed knowledge of GIS.

The project has been taken up under Technical Assistance Programme of the World Bank and is expected to be completed by December 2005.


An Innovative Pavement for Rural Roads

Dr B.B. Pandey
Professor of Civil Engineering, Indian Institute of Technology

PMGSY requires a massive investment for providing connectivity to human habitations, therefore unconventional methods of construction, requiring lower funds must be explored. Any saving in the construction cost can add many kilometeres of road within a given budget. An innovative cement-based construction method costing only a fraction of the cost of concrete pavement is described below.

Cast-in-situ Concrete Block Pavement

This consists of a framework of polyethylene cells of size 150mm by 150mm with depth varying from 50mm to 150mm or greater (Fig.1) with cement concrete filled into the cells and compacted. A depth of 75mm to 100mm may be sufficient for rural roads. The thickness of polyethylene sheets may be about 150 to 250 microns The plastic cells are stretched over the carriageway under tension and filled with concrete and compacted. During the compaction, the cell walls get deformed (Fig. 2) during the compaction bringing about interlocking among the concrete blocks.

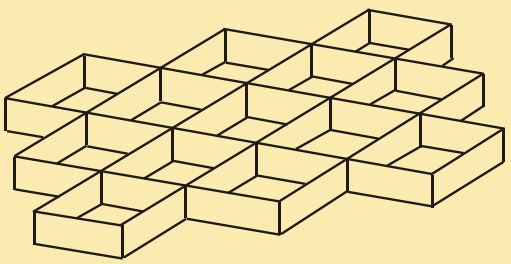


Fig.1 Framework of Plastic Cells after Tensioning

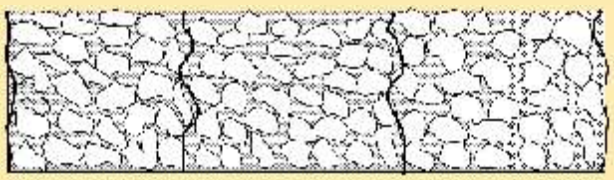


Fig 2 Cell filled Concrete after Compaction

There can be three methods of construction of such pavements:

Method–I

The cells are filled with single size aggregates and rolled with static or vibratory roller. A mortar of cement and sand is placed over the compacted aggregate and vibrated into the voids by a plate vibrator so that the road can be opened to light traffic within 24 hours of the construction. The cell-filled concrete blocks behave as flexible layers and conform to the deformed shape of the underlying sub-base, if there is any additional compaction or settlement of the subgrade. This type of construction is likely to be cost effective for pavements of low volume roads and may have better riding surface than a concrete block pavement. Such a pavement can be constructed directly over the subgrade if the CBR of the subgrade is higher than 5. A granular sub-base may be necessary if the subgrade CBR is less than 4. This method of construction is labour intensive and would generate employment. It is necessary that the flakiness index of aggregates does not exceed 30. River gravel is the most appropriate aggregate for the grouting method.

Method–II

After the cells are stretched on the prepared sub-base, the cells are filled with concrete at optimum moisture content and compacted by a static or vibratory roller. This method is appropriate when flakiness is higher than 30. The interlocked structure is similar to Fig.2.

Method–III

In case a standard concrete mix is to be used, the cell walls should have hemispherical indentations so that the blocks are interlocked even when a standard concrete or a self compacting concrete is used.

Falling Weight Deflectometer tests, on an Accelerated Pavement Test Facility at IIT Kharagpur, have indicated that equivalent elastic modulus of 100mm thick cast-in-situ block layer is close to 2500Mpa which is equivalent to 136mm of high strength bituminous concrete, and the thickness requirement of granular layer is very less. Riding quality is much better than an interlocked concrete block pavement. The pavement will be resistant to moisture damage and it is likely to be maintenance free for about 20 years. Moreover, the initial cost is found to be lower than that of a flexible pavement.

PMGSY Roads to Prosperity

Project Implementation Consultants for PMGSY

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

With an increasing volume of work and targets for achieving the set goals under Bharat Nirman, it is essential that organizational structure and management techniques are improved. Non-availability of trained personnel, inexperience in application of desired management methods generally are leading to critical situations in achieving the goal and targets. As such, there is a need to enhance implementation capacity. Capacity enhancement measures include training of the existing personnel, borrowing suitable officers from other departments and training them, where necessary, and outsourcing some of the activities to suitable and competent consultants. As the increased burst of activity is likely to be for a short duration of, approximately 4 to 5 years, it would not be prudent to create and add regular staff for handling the additional volume of work. While imparting training to the existing staff is one of the key capacity enhancement measures, supported by NRRDA through World Bank Technical Assistance, availability of experienced manpower appears to be one of the serious constraints. After the available potential has been fully utilized, any further expansion of capacity will need to be done by resorting to 'outsourcing' to supplement in-house capabilities. Considering the overall scenario, standard documents for engagement of Project Management Consultants (PMC) and Project Implementation Consultants (PIC) were developed in NRRDA and circulated to all the States. However, this was not used readily in the past by the States, primarily in the absence of financial support as well as the required mind-set for a change in the method of working. These issues have now been addressed. In order to build up executional capacity at PIU level in PMGSY for Bharat Nirman, Ministry of Rural Development has framed and circulated procedural guidelines required to be followed by Nodal Agencies. To facilitate expansion of capacity, it has also been agreed to fund engagement of PIC out of PMGSY funds in respect of Core States and Hill States including North East, where capacity problems are most severe in relation to the goals of Bharat Nirman in respect of rural roads.

The scope of work for Project Implementation Consultant (PIC) is envisaged at preconstruction stage as well as work supervision stage. At preconstruction stage, the PIC is required to assist the PIUs in the preparation of DPRs by conducting necessary field surveys, and design and preparation of bill of quantities (BoQs). PIC is also required to assist in the preparation of tender document and technical evaluation of bids in case of capacity constraint, at PIU or SRRDA level. Under work supervision, the PIC is required to act as "Engineer" providing supervision, quality control, performance monitoring at each stage. Depending on the availability of staff with PIUs, certain functions, such as verification of bills, levy of liquidated damages, dispute resolution etc. can be retained by the PIUs. Training of PIU and contractor staff is also the responsibility of the PIC so that there is gradual building up of capacity at the State level. In case of externally aided Projects, social and environmental issues are also required to be attended to at the project preparation, execution and reporting stages.

The Project Management Consultants (PMCs) are basically to advise and assist the Nodal Agency in programme implementation. Their major role is advising and providing necessary guidance relating to planning activities, Works procurement, Contract management, Monitoring, Training and Capacity building. If required they can also be assigned the work of Second Tier Quality Monitoring, and even the work of the State Technical Agency (STA). Initially PMCs are envisaged to be deployed to meet the need of North Eastern States where the requirement is urgent.

The engagement of consultants is required to be made in a very transparent and systematic manner. With this in view, wide publicity is envisaged for inviting Expression of Interest (EoI). The information furnished is evaluated with reference to a set of parameters and short listed agencies are sent a full document called Request for Proposal (RFP). Separate technical and financial offers are invited through the two envelope system. Bidders are invited to attend a pre-bid meeting in order to clarify issues and answer queries or any matter related to RFP. Provision for amendment to RFP has also been made based on the issues raised during the pre-bid meeting. The technical and financial offers are required to be submitted in the prescribed proformae. The objective of asking information in the prescribed proformae is two fold. One, to get all the required details. Second to have the information in similar format for evaluation with reference to the parameters. Detailed guidelines are provided in the document for filling up the required information in the format. Evaluation criterion is decided in advance and forms a part of the RFP. Also, the staffing schedule, qualification and experience of the deployed personnel is dependent upon activities assigned in the Terms of Reference (TOR). The technical offer is evaluated with reference to the experience of the organization, approach and methodology as well as the CVs of the experts proposed to be deployed through a Consultant Selection Committee (CSC) formed at SRRDA level. Agencies scoring less than 75% are not considered eligible for the work and their financial offer is returned back unopened. Final selection is quality cum cost basis (QCBS) with 60% weightage on technical evaluation and 40% on financial score.

The Consultants are to be engaged for a period ranging from three to five years as per requirement. It is expected that within this period PIUs of the Executing Agency would have picked up good planning, construction and management practices from the consultant. If the consultancy is for preconstruction stage activities only, each PIC is required to furnish a Performance Security valid upto 12 months construction period of last batch of DPRs, plus six months to cover poor performance discovered during execution, based on the DPRs. For other cases, it is contract period plus six months. Provision for penalty also exists in the agreement. Action under this provision can arise on failure to render satisfactory services or reports; work certified by PIU not meeting the quality requirement discovered through independent checks by SRRDA and; non deploying / replacing specified personnel.

The engagement of PMC or PIC does not mean that inputs from the Nodal Agency or the SRRDA are totally eliminated. There has to be constant performance monitoring and interaction so that the best output can be obtained. It would be necessary to ensure that the team leaders and key personnel of the consultant are not changed frequently. In many cases consultant personnel are drawn from retired engineers of PWDs. Unless they adjust themselves into the new role, there are chances of conflicts between the consultant and the employer. Also it would be necessary that new systems, and methods brought in by the consultant are given a trial without totally ignoring the PIUs or the Nodal Agency.

If PIC/PMC are objectively selected and appropriately deployed with clear definition of scope and domain, not only will the PIUs get the advantage of being associated with experts in the field to learn arrangement, they, over a time will be ready to take up the task on their own. Moreover, adequate capacity and exposure to good practices with make PIUs confident in delivery mechanism. PICs also fill up the short-duration skilled manpower shortage required to achieve the targeted programme objectives.

A feel of the Sout

The Indian PMGSY Team at the entrance of the Indian High Commission, Pretoria:

(From L to R) Shri Sudhir Kumar Rakesh, Principal Secretary (PWD), Government of Bihar, Shri S R Sharma, Principal Secretary (RD), Government of Jharkhand, Shri S. Vijay Kumar, Director General, NRRDA, Smt. Alka Sirohi, Principal Secretary(RD), Government of Madhya Pradesh, Shri Rajiv Aggarwal, Addl. CEO, UPRRDA and Shri Meiran Aiyar, E-in-C, Nagaland. Not in picture are Shri S.Baliga, Director(Projects), NRRDA, Shri S.P.Negi, Chief Engineer, HPPWD and Shri C.S.Rajan, Principal Secretary(PWD), Government of Rajasthan.

A group of officers from the State Governments of Madhya Pradesh, Jharkhand, Rajasthan, Bihar, Uttar Pradesh, Himachal Pradesh and Nagaland and 2 officers from NRRDA visited South Africa and saw the rural roads programme there from 27th June to 2nd July 2005. The visit was hosted by SANRAL, the South African National Rural Roads Agency Ltd., which organised programmes including presentation on the national, provincial and local road network construction, management and maintenance systems as well as field visits to see rural road construction and maintenance practices.

South Africa has an extensive road network comprising national roads managed by SANRAL, provincial roads managed by Provincial Governments and local roads managed by Local Administration. Over 50% of the network is gravel and other unsealed roads. Unsealed road construction is extensive in South Africa because of the low rainfall, and low traffic in many areas. Where gravel is not available, cement-soil stabilised unsealed roads are also constructed. In fact, soil stabilisation of the sub-base is a routine practice on almost all roads.

Field visits included a site visit to a cement-soil road under construction (see photographs below) in Polokwana (Petersburg) Limpopo Province; and a bituminous sealed gravel road in Cape Province. Cape Province has a very sophisticated unsealed roads management and maintenance system which is fully computerised with GIS outputs. Pavement Condition Surveys are done using vehicles and parameters recorded for

every 2 km stretch, to produce a pavement deterioration model which guides investments in periodic maintenance and upgradation.

Unsealed / gravel roads are designed as engineered structures and executed under close supervision to ensure full compaction in layers at optimum moisture content. We travelled on 2-3 year old gravel roads which had excellent riding quality, though dust was obviously a problem. Based on the visit and discussion therein the following broad conclusions were drawn:-

- As in India, in South Africa, earlier gravel roads were not well engineered. However, now adequate attention is being paid and Cape Province is one of the leading Provinces for gravel road management.
- Gravel roads are a suitable option under specific condition of low rainfall, availability of gravel material etc.

A view of the cement-soil stabilised road under construction in Polokwane (Petersburg), Limpopo Province. Notice the confinement of the material, and the different stages of compaction, laying and mixing taking place along the stretch.

th African Gravel

S Vijay Kumar, Director General, NRRDA

Mixing of the material taking place at site. Water barrels are placed along the alignment and tanker fills up the water in advance. Tested soil is dumped in heaps at intervals along the alignment, and controlled mixing with cement takes place under strict supervision of contractors' engineers.

- Though construction cost may be upto 30% less, maintenance costs may be higher and sometimes re-gravelling may be unviable. On the other hand maintenance is more easily managed by the local community in the case of gravel and stabilised soil roads, which is a plus point in remote areas.
- Cement-soil stabilised roads are a good option in low traffic volume roads provided the contractors / engineers are trained. If the local community is involved in mixing and laying of the material, the local employment generation and sense of ownership created makes it a preferred option particularly if rainfall is low.
- On a life cycle basis, the cost of gravel / stabilised roads is generally more favourable when good aggregates for base course are not easily available or lead distances are high. While gravel / unsealed roads may create local employment in construction and maintenance, dust raised by traffic is a major inhibiting factor.
- Provinces in South Africa have successfully laid bituminous and other seals on gravel roads to reduce dust and maintenance requirements which need to be studied closely in the Indian context.

All in all, the visit was successful in reducing the in-built prejudice against gravel roads in India caused by earlier defective design and execution methodologies. However, much more has to be done before gravel roads are easily accepted as a viable option even in favourable conditions. Clearly a long-term technical collaboration and a return visit of South African engineers to India is the next step.

"Mixed material is spread in layers evenly and camber is maintained."

"The spread material is rolled from the centreline outwards to the edge and the number of passes is closely checked by the contractors engineers. After compaction is achieved, the next layer is spread and compacted till the required design thickness is reached."

Memoirs Of A Visit To Australia

Dr. M.N. Roy, Secy. (RD), Govt. of West Bengal

Introduction: NRRDA organized an Inspection Tour to Australia to study the Planning, Construction and Management of Roads in that country for possible emulation of good practices in the implementation of Pradhan Mantri Grameen Sadak Yojana (PMGSY). The following is a brief memoir of the visit of Australia where Royal Melbourne Institute of Technology (RMIT) made arrangements.

The Professional Approach: The most striking feature encountered during the visit is the professional approach in addressing the issues. The interactions with the Planners, Engineers and even with the functionaries of the local government amply highlight this approach, which reveal meticulous planning and documentation leading to an efficient teamwork. Professional approach and better use of technology help in managing a large volume of work with a lean organization with specialized personnel.

Road System and Strategy: The strategy is broadly guided by systematic assessment of traffic and transportation needs, duly analyzing the economic returns, environmental impacts for social and economic rehabilitation. Experts from the road wings of state and national level organizations like VICROADS, AUSTROADS, helped in understanding the policy and investment decisions relating to the transport system. While the construction of roads is to meet the needs of the people, it is also seen as a sound investment for economic development. The need for more thorough analysis of the system is amply demonstrated where investments are high with scarcity of funds. A noteworthy point that came to light is the adoption of low cost unsealed roads for connecting highly sparse populations. What impressed, however, was the consideration shown to maintain traditional rights of aboriginals, which are never disturbed while designing any road.

Planning and Designing of Roads: Though designing of roads is purely an engineering job, there are some aspects which the policy makers should be aware of, such as opting for unsealed roads with provisions for systematic drainage. The visit of sites amply demonstrated this. The team was also exposed to advanced technologies in road design construction and maintenance with the use of data collected through the most modern data acquisition systems. The concept of road performance was also highlighted by judging the condition against stated standards and taking corrective measures, where necessary.

Road Safety: With the construction of more roads and increasing number of vehicles, road safety has become an important issue. This is addressed right from the design stage with road-wise documentation of accident prone areas and identification of black spots. Involvement of local population in ensuring safety were the highlight of the discussions. It was emphasized that each complaint made by local people is documented and analyzed for improving Road Safety.

Road Maintenance: Maintenance of roads, needless to say, is one of the most important aspects of road system management and Australia has developed a very good system of road maintenance strategy with the help of historical data. Resource-based maintenance management strategies, from preventive maintenance to total rehabilitation are worked out. This is one aspect where India can draw lessons from Australian experiences.

Traffic Management: As a part of the tour, traffic management of Sydney city was demonstrated with round the clock monitoring and coordination of all concerned. This is in contrast to the system prevailing in our country where management of traffic and management of roads are treated in isolation. The coordinated effort in accident monitoring and post accident measures, as practiced in the city of Sydney, was an eye-opener. Citizen interface in sharing information and providing guidance is the hallmark of the traffic management system there.

Professional Service Providers and Management of Contracts: The government agencies are very lean in Australia and hence most of the works like design, construction and maintenance of roads is managed by outsourcing and is made possible with the availability of many professional agencies. The outsourcing based system is working well. Such a system, perhaps may be, inducted in the implementation of PMGSY with careful selection of Professional Agencies with a high level of competency and willingness to work in rural areas.

Responsibilities of Local Bodies: The system of local governance is well developed in Australia. Except the national corridors, maintenance of all roads are with local government. On a visit to a local government body at *Shoalha Ven*, the team was explained how the management of roads is carried out. This is yet another area where the experience of Australia can be borrowed in involving local bodies in the maintenance of rural roads.

Investment for Roads and Public / Private Partnership: It is becoming difficult for governments everywhere, including Australia, to find resources for investment in the road sector. Private investments in roads are being resorted to in Australia to overcome the problem. There was an exposure on various options for private investments and issues related to private-public partnership (PPP).

Conclusion: We have come back richer by experience in terms of the new ideas as well as the actual practices related to the overall system of road management. This will certainly help in a big way to better plan and implement the PMGSY programme. Some of the organizational, technological and attitudinal aspects in management of roads practiced in Australia have many lessons for us to adopt in India too.

Bridging the Rural - Urban Divide!

Stone Aggregates : Country's Precious Asset

L.R. KADIYALI, Consulting Engineer

Construction of new Rural Roads and the upgradation of existing ones will be high on the country's agenda for the next 20 years. The conventional specification that is being currently adopted for the pavement is Water Bound Macadam. The physical requirements for stone aggregates in the present specifications always prompt the engineer to select hard varieties of stones such as granite, basalt and quartzite. Under the BAU (Business As Usual) Scenario, it has been roughly estimated that 1.6 billion cubic metres of stone aggregates are required, and every year 80 million cubic metres will be needed. Parts of the country are happily endowed with large deposits of hard stones. But this does not grant us the mandate to recklessly exploit them. Firstly, there are other more pressing demands from the National Highways and State Highways sector, buildings sector, irrigation/power sector, and the railways. So, Rural Road engineers must be careful not to over-exploit the hard stone deposits. Alternatives must be explored.

In the plains of the north (Uttar Pradesh, Bihar, West Bengal) and states of Tripura and Mizoram, hard stones have to be brought from certain sources over long leads (200 to 400 km). This makes the road expensive, and the construction schedule dependant on the deliveries from quarry owners, some of whom have formed a cartel or a monopoly. In these states, the cheaper alternative would be brick pavement or overburnt brick ballast for sub-bases and bases. Since switching over to the costly stone aggregates option, the art of manufacturing good quality bricks for pavement and over-burnt bricks for ballast seems to have been forgotten. *Kankar*, lime-stone aggregates, is available in certain parts of Uttar Pradesh and Rajasthan, and this material used to be the popular road building material over the past many centuries. However, this material seems

to have been now discarded. Its reinvention should receive high priority. A cheap option, so popular abroad, but hardly practiced in India, is cement-soil stabilisation. The addition of 4-6 per cent of cement to local soil can result in a hard sub-base and base material. It may cost Rs. 400-600 per cu m, and is much cheaper then stone aggregates in many situations. Aggregates of laterite stones may not be as strong as granite or basalt, but they can serve the purpose of sub-base/bases for Rural Roads. The addition of cement to naturally occurring gravel (river borne gravel as in Assam or *murram* in peninsular India) can result in a strong material that can be used for sub-bases and bases. Lime stabilisation of clayey soils is a good alternative to stone aggregate base specifications. Lime can also be used in combination with fly-ash or cement. Some chemicals like Fujibeton and Renolith, added in small quantities to cement, can transform soil-cement bases to a hard durable surface, which may not then need a bituminous surfacing.

To conclude, stone aggregates are the country's assets, having diverse use. Since the Rural Road programme envisages a large quantity of sub-bases and bases in the pavement, alternatives such as soil-cement, soil-lime, lime-flyash-cement-soil, soil-cement with Fujibeton or Renolith, should be explored.

Status Report for Online Accounting

Rajasthan and Madhya Pradesh have achieved 100 per cent online accounting status. Substantial progress has been made in Uttar Pradesh, Chhattisgarh and West Bengal, where several districts (PIU's) have moved to the online system. Himachal Pradesh is also expected to be online by the end of June, 2005.

PMGSY Operations Manual

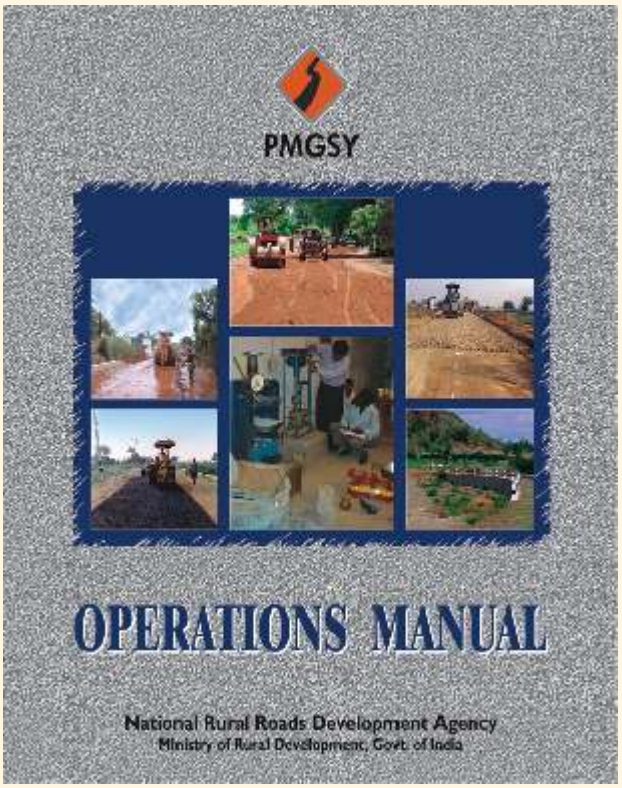
H.K. Srivastava (Director Projects-I), NRRDA

First issue of Grameena Sampark reported that a workshop was held in the last week of December 2004 to discuss the contents of Operations Manual. The Operations Manual has since been finalized, printed and distributed to all the stake holders of the Programme. This article brings out salient features of the Operations Manual.

The PMGSY was launched on 25th December 2000, as a Centrally Assisted Rural Roads Programme. Over the last four and half years, the PMGSY has made a place for itself as a programme characterized by detailed planning, methodical execution, careful management and high quality consciousness. The Rural Road Manual IRC SP: 20 was brought out in the year 2002. As the programme progressed various procedures relating to operational and procedural aspects were required to be streamlined. This was done through close interaction between the Ministry of Rural Development and the State Executing Agencies as well as involvement of Principal and State Technical Agencies and Senior Engineers of the State and Central Government including retired Engineers working as National Quality Monitors. Several clarifications to PMGSY guidelines as well as circulars were issued to streamline the process. Provisions relating to different topics were dispersed in PMGSY guideline Clarifications / Amendment to guidelines, circulars, letters to different functionaries etc. Also, procedural aspects relating to some of the topics such as Procurement, Quality Assurance, Contract Management, Accounting Procedures and Maintenance, being of procedural nature, were followed differently as per practices prevalent in the State. As such there was a need to put together all the provisions relating to different aspects of the programme implementation in a seamless manner at one place. To meet this requirement Operations Manual in respect of PMGSY has been brought out. State Governments may however, find it advantageous to adopt many of the principles and practices in the Manual in the Rural Roads Programme other than PMGSY.

The compilation process started with entrusting work to a Consultant due to capacity constraint within NRRDA. However, detailed input was required to be made by different Directorates who were more conversant with the operations, not only at MoRD / NRRDA level but also at the State level through various interactions including the Regional Review meetings, discussions during Pre-Empowered Committee and Empowered Committee meetings. The modified draft was circulated to all the States, PTAs, STAs and NQMs to invite comments. This was subsequently discussed during a workshop and the coverage and contents were finalized. Revisions in the programme guidelines as well as issue of revised guidelines for Quality Assurance, Rural Road Specifications and Data Book were also inputted before the document was ready for publication. The published document is also available on website http://pmgsy.nic.in

The Operations Manual is to be used by the project implementing agencies as a document which provides administrative instructions and comprehensive documentation relating to required institutional structures, planning, preparation and clearance of annual proposal, methods of design for rural roads, procurement for projects, project implementation and contract management, quality



management, flow of funds and accounting system, online monitoring, maintenance and road safety. Detailed guidelines, steps involved in each operation, and checklists have been provided. Detailed guidelines on soil & material survey, use of local and waste materials have been provided as supplement in annexures for ready reference. Environmental management issues with additional requirements of hill and desert areas and issues required to be considered during maintenance have also been added. On technical aspects, the connected IRC publication will require to be consulted. However, the accounts and works manual of the States shall continue to be used and if provisions in the OM are at variance with these, specific direction of NRRDA is required to be obtained.

Highlights of a Few Chapters of the Operations Manual

Annual Proposals:

The Rural Roads covered under PMGSY are required to be selected from the Core Network. Since providing connectivity is the prime objective, the road list is to be selected from the priority list which has to follow laid down selection criteria. While preparing the Core Network and finalizing the comprehensive New Connectivity Priority List (CNCPL), consultation with Panchayati Raj Institutions and Elected Representatives is to be made. Once the CNCPL has been firmed up, road works of lower order of priority will not be taken up in the same district where road works of higher order of priority still remain to be taken up. Lower order roads can be considered only when it is not feasible to execute the higher order of work due to non availability of land etc. For upgradation works the basis would be the COPL based on the results of road condition

survey. The first priority will be for through routes which are presently WBM roads. The second priority would be through routes or gravel roads. The last priority would be through routes which are at the end of their design life. Normally such roads would have PCI of two or less.

Where existing rural through routes are in very poor condition, upgradation or renewal of such roads may be taken up as an adjunct to new connectivity (Concept of Associated Through Routex). Procedure as detailed in the OM is to be followed in the selection and project preparation.

Procurement:

Standard Bidding Document (SBD) was circulated to all the States alongwith a 36 point check list for adopting as State Specific Bidding Document. Many of the provisions and clauses were different from the State practices. As such, it was felt that detailed guidelines on important aspects are required to be detailed out in the Operations Manual. The OM provisions highlight the steps required in the preparation of the Bidding document, generating press advertisement and bidding document from OMMAS and the precautions required to be taken at the time of opening of bids and evaluation of technical and financial bids. The evaluation criteria has been explained in detail with reference to each of the parameters such as qualification, availability of equipment and personnel, past experience of the works, as well as, the sub contracting component of the works. Clarification has also been provided on steps required to be considered if the works are to be retendered. The OMMAS input formats for publication of tender notice and generating package-wise documents have been added so that the PIUs can generate the complete bid document without committing mistakes.

Project Implementation and Contract Management:

This again is flowing out of the Standard Bidding Document (SDB). However, important provisions in the agreement alongwith relevant clauses have been highlighted in the chapter so that, after the work is awarded, PIUs are guided towards steps required to be taken by them. The broad categories are time control, cost control and quality control. This chapter also lays stress on timely release of payment to the contractor during execution of the work as well as after completion. The process required for finalizing the accounts and release of performance security and deposits has also been indicated.

Quality Management:

Detailed guidelines and the reporting formats were formulated and circulated to all concerned. In this chapter steps have been explained in detail and suitable performae added to facilitate monitoring and reporting. The responsibilities of the Second Tier State Quality Coordinator (SQC) have been detailed out. In addition to the reporting responsibility he is also made responsible for preparing the annual report for analyzing the general deficiencies occurring within the State and also to suggest remedial measures.

Monitoring:

Monitoring formats were circulated from time to time as part of guidelines. In this chapter stress has been laid on Online Monitoring. Accordingly, the action required and responsibilities have been clearly spelled out. The responsibility at DPIUs level and SRRDA level and NRRDA level have also been defined. The monitoring at the State level includes the proposal stage, survey, DPR preparation and clearances, procurement, proposals dropped and progress of work. In addition, the responsibility of monitoring of contracts relating to time, quality and payments have been defined and monthly and quarterly report prescribed. The Regional Review format relating to institutional and capacity issues have also been indicated. A new monthly return on unspent balances of PMGSY funds with a State has been prescribed. This report is required to be furnished by the Empowered Officers as well as the bank.

Finance and Accounting System:

The PMGSY accounting system is primarily based on Public Works Accounting System with minor modifications. The basic difference is the system of flow of funds which comes to designated bank account of the SRRDA and also preparation of balance sheet. Separate set of accounts are required for PMGSY programme funds, administrative expenses and, maintenance. Steps required for regulation of the funds have been brought out into the OM. Charts of accounts alongwith explanatory notes for easy understanding have been provided. Procedures for release of programme funds and administrative expense funds alongwith the audit requirements have been detailed out. Up to date data entry on OMMAS has been made mandatory.

Maintenance:

Maintenance aspect is one of the most neglected subjects with the States. A five years maintenance, to be paid by the States, is an integral part of the Programme. The provisions in the Rural Roads Manual have been explained detailing out procedures for remedying defects during the 5 years contract period. Stress has been laid on maintenance planning through pavement condition survey and listing of maintenance priorities based on availability of funds. The Periodicity of Routine Maintenance Activities has been defined clearly with reference to the clauses in the Book of Specifications. Norms for Routine Maintenance Activities have now been prescribed so that an estimate could be made at the project preparation stage and monitored at execution stage.

It is expected that guidelines and detailing contained in the Operations Manual would facilitate systematic implementation of the Programme. Though the draft of the Manual has been extensively circulated and discussed, there is always scope for improvement. As such, OM is intended to be a dynamic document. Based on experience gained during further implementations as well as comments, feedback received, the provisions may be modified accordingly.

PMGSY Roads will last not only because they are well constructed but also because they will maintained


PMGSY DOs and DON'Ts in Quality

Prabha Kant Katare, Jt. Director (Project-III, QM), NRRDA.

In earlier issues, the Dos and Don'ts in quality of PMGSY roads were discussed for Setting out, Site Clearance, Embankment, Earth Work and Granular Sub-base construction. In this issue, Dos and Don'ts in the Construction of WATER BOND MACADAM (WBM) as Base/ Sub-base course are covered.

Water Bound Macadam (wbm) Base / Sub-base Course

Steps:

- Select the quarry for course aggregate by performing the prescribed tests. Give clear guidance to the supplier regarding requirement of grading.
- Plan for stacking of Course Aggregate (CA) and Fine Aggregate (FA) strictly on the basis of requirements in a given stretch of the road (Normally 200m.).
- Allow the stacking of only approved CA and FA, as per the stacking plan. Carry out required balance tests after stacking and if sub-standard material is stacked, it must be removed before the work of laying of aggregate is started.
- The surface to receive WBM course should be prepared to the lines and cross fall (camber or super elevation) make good irregularities, if any, by profile correction.
- Spread the CA uniformly on prepared base to proper profile by using templates placed across at 6 m. interval. Also spread the material for shoulders. The loose quantity of the aggregate should be sufficient to get required compacted thickness.
- Roll the surface till aggregates are partially compacted and sufficient void space is left for application of screenings/ FA. Rolling of shoulders and aggregate should be done simultaneously.
- The surface evenness should be maintained at this stage. Check the profile for longitudinal and transverse evenness. Carry out required corrections by loosening the surface and adding or removing material and by re-rolling until the entire surface conforms to specific cross fall and grade.
- Apply dry screenings to completely fill up the interstices in three or more applications.
- The screenings should not be dumped, the application should be slow and at a uniform rate accompanied by brooming and rolling in dry condition. This dry rolling should be continued till no more screenings can be forced into the voids.
- Once the dry rolling is complete, the surface should be copiously sprinkled with water, swept and rolled. Sprinkling, sweeping and rolling should continue till aggregates are thoroughly keyed, well bounded and firmly set in its full depth and a grout of screenings has been formed.
- If binding material is to be applied, it will be done successively in two or more thin layers at a slow and uniform rate. After each application, the surface shall be copiously sprinkled with water, the resulting slurry swept in with hand brooms to fill up the voids properly and then rolled. This operation should be continued till the resulting slurry, after filling the voids, forms a wave ahead of the moving roller.
- The compacted surface should be allowed to completely dry and set before opening for traffic or construction of successive layers.
- The black topping of the WBM surface should be done within a reasonable time, if the stone screenings are used without binding material. If BT is delayed, the reveling can be avoided by spreading a thin layer of suitable soil.

Examples of Poor Roads Construction

Myths:

- Is WBM Grading I base course? No, it is an equivalent sub-base course.
- Should binding material be used in WBM? Not always necessary.
- Spread metal and screening then water the entire mass and roll it? Totally wrong. Proper dry rolling, wet rolling as per specifications is a must, otherwise WBM will not sustain.
- If water is not available for drinking, how can we use water for WBM? If water is not available, don't execute the work because without water, it is not WATER BOUND MACADAM.

Do's and Don'ts

Do's	Don'ts
▪ To approve the source for CA and FA, carry out required tests at source.	▪ Don't allow the material to be stacked at site without prior approval after necessary testing.
▪ Indicate the grading requirements to the supplier and also make it clear that the material of required gradation will be allowed at site.	
▪ Stack the material for shoulders and WBM in such a way that excess or less material is not collected in the given length of road.	▪ Don't start laying of WBM and shoulder unless the CA, FA and shoulder material is collected in appropriate proportions in a given length of road.
	▪ Don't allow fully rounded pebbles or river borne material. If crushed gravel/shingle is used, not less than 90% pieces retained on 4.75 mm sieve shall have at least two fractured faces.
	▪ Don't use Moorum/ Pit gravel as screening material unless it conforms to one of the grading and other requirements given in the Specifications.
▪ The surface receiving WBM should be prepared so the lines and cross fall either as per requirements of camber or super elevation. The irregularity should be evened off.	▪ Don't lay WBM on un-prepared and uneven surface of sub-grade/sub-base.
▪ Spread the course aggregate as well as shoulder material simultaneously.	▪ Don't use earth-edging to confine the course aggregate, instead spread the shoulder material.
▪ Dry roll the course aggregate without application of screenings in such a way that aggregates are partially compacted and sufficient void space is left for application of screenings.	▪ Don't apply screenings unless the course aggregate has been adequately dry rolled.
▪ Check the profile, longitudinal and transverse evenness after initial dry rolling but before application of screenings.	▪ Don't allow any unevenness at this stage otherwise it will not be rectified in subsequent stages.
▪ The screenings should be applied slowly at a uniform rate in three or more applications in dry condition. At every application, the screening should be broomed associated with rolling in such a way that it is forced inside the voids of the course aggregate.	▪ Don't dump the screening. Screenings should not be damp. Do not apply screenings fast and thick as to form cakes or ridges on the surface.
▪ Continue rolling till no more screenings can be forced in the voids.	▪ Don't add water unless dry rolling is complete.
▪ After dry rolling, the water should be copiously sprinkled.	▪ Don't put excessive or inadequate quantity of water. Watering should be a controlled activity. Ensure that the surface receiving WBM does not yield because of excessive watering. Otherwise the curse aggregate will penetrate and wavy surface resulted.
▪ The rolling should commence from the lower edge and shall proceed towards the upper edge at super-elevation.	▪ Don't leave the rolling at the mercy of the roller driver. Rolling should be strictly supervised.
▪ All loose, segregated or otherwise defective areas should be made good to full thickness of the layer and re-compacted during rolling itself.	▪ The speed of the roller should not exceed 5 km/ hr.
▪ If binding material is used, the quality should conform to the specifications.	▪ Don't allow earth and soft moorum as binding material. The quantity and quality of binding material must be checked.
▪ Every application of binding material should be associated with watering and rolling to force the slurry to enter into the void spaces.	▪ Don't stop wet rolling unless the slurry of binding material forms a clear wave ahead of the moving roller.
▪ The compacted WBM should be allowed to dry and set.	▪ Don't allow the traffic unless the WBM is set.

Let's Do Quality

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The term 'quality' has been defined as the totality of features and characteristics of a product or services that bear on its ability to satisfy stated or implied needs. In the contractual environment needs / requirements are specified, whereas in other environments implied needs or requirements need to be identified and defined. However, the term quality needs to be viewed in a wider perspective to include the process, be it decision making, communication, implemention, feedback or the product. Even a letter, a note sheet, a cup of tea is a product at a particular level in the organization derived through a process. The following is arrived at by sieving through a few articles / theories put forth by peers in the field who could well be considered part of the global think tank (if there is any). Let us see to what extent it applies to our day to day activities and to what extent it will affect us.

There is much talk about the need to improve Quality and Productivity. Moreover, everyone knows exactly how to go about it! In the eyes of top management, the biggest trouble is that a lot of employees in the operation and management are careless and neglect the job. One writer has a solution hold all employees accountable for job behavior as well as for the results expected of them. The fact is that performance appraisal, management by numbers, management by operations and work standards have already devastated western industry. More of the same could hardly be a solution. We are experimenting with the same. Other writers see information as the solution. Anyone can improve his work if he has enough information. The fact is that a figure by itself provides no information, has no meaning, no interpretation in the absence of a theory. Briefly put, there is no substitute for knowledge and a figure by itself is not knowledge. Knowledge endures longer than information.

Other people put their faith in gadgets, computers, new technology etc. Solving problems is not the answer, nor does it result in improvement of operations. These are not the transformations required to achieve desired standards of excellence. Likewise the concept of zero defects are highways down the tube. The bitter truth is that all parts of the machinery may meet the specification, and yet the machinery may be unsatisfactory or may even be a total failure. Similar analogy applies to hiearchial levels in the organization. As such it is necessary to move continuously towards better and better performance of the finished product or the output as concentrating on components alone is not sufficient.

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. Efforts to leave out one or more of these components or to give undue emphasis to one at the expense of others may achieve some improvements, but they will always fall short of the potential of the organization.

Top Management Commitment: To achieve quality top management commitment is a must. Commitment needed is commitment of self: the management must commit their own egos, their own time and their own resources. The commitment must be active, obvious and informed. Active commitment means that they must improve what they themselves do. They must ensure that others know about their efforts to make it obvious. They must also be able to discuss the theory and practice of quality to make the process informed. As part of their commitment the top management must trust their subordinates to act. Here empowerment means authority equal to responsibility. No more. But no less. It does not mean that every person is allowed to do whatever they wish.

Leadership: Leadership is about humans interacting with humans. Among the lessons available from the military, is the one that leadership can be taught, it can be learned and it is important to have trained leaders at every level of the organization. It is necessary that once the trained leaders are put in place at every level of the organization, the decision-making process is allowed to migrate to frontline expertise rather than to the top pre-established hierarchies. In other words, it would be appropriate to defer to experts on the front line who have first hand information, awareness of strength and weakness of the organization.

Employee Commitment with a Structure: Quality by proclamation is not enough. Simply announcing 'we are now a quality organization and all of you people need to get better' gains nothing. Required set of procedures and output need to be put in place first. If the rules are required to be changed, employees of all levels need and deserve to know the new rules. Two areas, in general, need focusing. One is 'doing right things' and second 'doing the things right'. The first calls for evaluation of the process followed by addressing the question 'are we even built correctly to do what we want to do' ? In case the organization is not built correctly to carry out the tasks required to be done, appropriate changes in the organizational structure may be required to be made. This kind of restructuring is a powerful and necessary tool but only when done in the required context. Restructuring by itself tends to yield moderately short term gains.

It is, after all, quite possible to do the right things badly. Just as it is possible to do the wrong things very well. In many organizations people work long and hard to do the best they can with a tool they are stuck with. It is in the determination and subsequent implementation 'how to do things right' that everybody in the organization gets involved and it becomes the responsibility of the organization to make conditions possible for everyone to take an active role in defining and performing their job.

[To be concluded]

Second Study Tour of Vietnam

The second 14 member delegation comprising of Ms. Gargi Kaul, Director (F&A) and Mr. P.K. Katare, Joint Director (P-III) from NRRDA, Mr. A.K. Dutt, Director (RC) and Mr. V.J. Menon, Director (Finance) from the Ministry of Rural Development and the Officers of the implementing agencies of some States visited Vietnam in the month of May, 2005.

The team interacted with various functionaries of the Vietnam Road Administration (V.R.A.). Apart from interaction with the V.R.A. officials at Hanoi, the team also visited two provinces i.e., SonLa and Hue City and held discussions with the local administration or P-DoT as they are called. P-DoT looks after the construction and maintenance of rural roads there. The team also visited some rural roads constructed in these provinces, which included those constructed under World Bank assistance. Detailed discussions were held with the local functionaries on their experiences with gravel roads and the system of community participation.

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