

# Grameen Sampark



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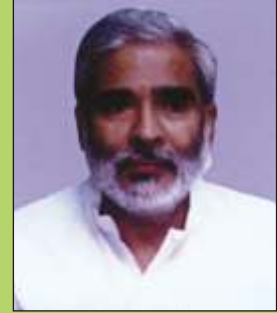
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ग्रामीण विकास मंत्री  
भारत सरकार

Minister of Rural Development  
Government of India



## M E S S A G E

The United Progressive Alliance Government is committed to provide all weather connectivity to the rural areas of the country. Under its ambitious programme of 'Bharat Nirman', providing connectivity to villages through Prime Minister Gram Sadak Yojana (PMGSY), is being implemented on highest priority. Under this programme, the Government shall ensure connectivity to all the villages of 1000+ population (500+populations in hilly and tribal areas) by the year 2009. The budgetary allocation which used to be around 2400 crores per year from the year 2000-01 to 2004-05 has now been substantially enhanced to 4200 crores in 2005-06 and 9000 crores for the year 2006-07.

The Ministry of Rural Development is closely monitoring the implementation of the programme by various State Governments. It has been made clear to all the State Governments that our objective is to ensure connectivity to all the envisaged villages, there is no limitation of resources. States have been asked to enhance their capacity of consumption so as to ensure utilization of resources within the given timeframe. As a result of close monitoring, the Ministry has identified 16 States/UTs whose pace of implementation is relatively slow. Their performance has separately been reviewed. Areas of concern have been identified. Necessary extra support is being provided so as to ensure performance of these States also.

As a measure of capacity enhancement, Central implementing agencies have also been inducted for implementation of PMGSY in Bihar, Tripura and Jammu & Kashmir. The results are encouraging.

The Ministry attaches highest importance to the quality of implementation and accordingly very strong three tier quality monitoring systems have been put in position. All the roads are expected to be inspected thrice during the course of its implementation.

In order to ensure people's participation, transparency and fairness, a citizen's board is being placed at every road indicating the details about estimate, timeframe and term of construction etc.

I am happy to note that NRRDA brings out a quarterly newsletter 'Grameen Sampark' for wider dissemination of information about PMGSY. I convey my best wishes for the next issue of this newsletter and hope that through this newsletter, people shall have access to updated information, as a result thereof quality and quantity of implementation of PMGSY shall further improve.

(Dr. Raghuvaran Prasad Singh)  
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The National Rural Roads Development Agency (NRRDA) was established on 14<sup>th</sup> 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.

Published by: National Rural Roads Development Agency (NRRDA), 5<sup>th</sup> floor, 15, NBCC Tower, Bhikaji Cama Place, New Delhi-110066

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Note: Accepted articles may be condensed.

## Editorial

### Cost Effective Technologies for Construction and Maintenance of Rural Roads

Under 'Bharat Nirman' a time bound business plan has been formulated to connect all habitations with population over 1000 with all-weather roads by 2009. In hill, tribal and desert areas, all habitations with population above 500 are targeted to be provided all-weather connectivity within this time frame. This bold but timely initiative to augment rural infrastructure seeks to connect 66,802 habitations with 1.46 lakh km of new link roads. Besides, 1.94 lakh km of existing through routes would be renewed/upgraded as a part of this plan. While implementation of this massive programme pose several major challenges, it has also opened up a window of huge opportunities to experiment and innovate in terms of application of technology. How can we effectively utilize the rich institutional and knowledge resources which we have in our centres of excellence for construction and maintenance of rural roads? What should drive and motivate us to think 'out of box' in this regards is not really 'cost control' but 'cost optimisation'. A recent paper on 'Investigations on Cost Effective Design of Rural Roads under PMGSY by Dr. Mehndiratta et al of IIT, Roorkee (Published in the journal of the Institution of Engineers) has shown that there is enormous scope for using locally available low grade materials and yet provide a road facility at our appropriate, acceptable level of serviceability. The study has brought out that lime-flyash macadam can replace conventional WBM which could bring down costs by 27 per cent. Further, pavement sections designed with steel industry wastes can reduce costs by 30 to 40 per cent.

Ministry of Rural Development (MoRD) has already taken up pilot projects to test the efficacy of use of jute geotextiles in construction of PMGSY roads in five States. These pilot projects are designed to achieve a cost-reduction of Rs.4-5 lakh per km as compared to the conventional method. We are very keen to support similar R&D interventions to experiment with alternative cost-effective technologies. As a matter of fact, one percent of our programme budget has been earmarked to promote such R&D projects. We would like to invite domain specialists and practitioners to contribute their valuable ideas on this for publication in the subsequent issues of 'Grameen Sampark'.

(J.K. Mohapatra)  
Director General, NRRDA





## PMGSY in Parliament (Winter Session)

Ashok Mehta, Deputy Secretary, Ministry of Rural Development

The Winter Session of Parliament commenced on 25<sup>th</sup> November, 2005 and continued up to 25<sup>th</sup> December, 2005. During this session, 1 Calling Attention Motion, 1 Starred Question and 10 Unstarred Questions were raised in the Lok Sabha. In Rajya Sabha, 1 Starred Question and 17 Unstarred Questions were raised. Dr. Raghuvansh Prasad Singh, Minister of Rural Development [M(RD)] replied to the Calling Attention Motion and the Starred Questions. Smt. Suryakanta Patil, Minister of State of Rural Development [MOS(RD-P)] replied to the Unstarred Questions.



### LOK SABHA

On 2.12.2005, Shri Chandra Sekhar Dubey desired to know the details of commencement of construction of roads for IV<sup>th</sup> & V<sup>th</sup> phase in different parts in the country, particularly in Jharkhand, alongwith the present status of each such road state-wise; otherwise the reasons thereof and the steps taken towards road construction work may be indicated. Further, he desired to know the details of pending proposals of Jharkhand or National Rural Roads Development Agency and the steps taken by the Government in this regard. In reply, MOS(RD-P), while enclosing a statement indicating details of state-wise roads approved under Phase IV and

Phase V of PMGSY, informed that this Ministry does not maintain data of the approved road works; details of roads being constructed under PMGSY are to be made available by the State Governments on the website [www.pmgsonline.nic.in](http://www.pmgsonline.nic.in). The statement enclosed contained the details of value of proposals cleared for Phase IV and Phase V. In total, for Phase IV (2004-05), value of proposals cleared is Rs. 4804.28 crores for 6661 road works involving 22885.96 km length. For Phase V, the value of proposals cleared is Rs. 2710.90 crores for 2396 road works involving 10348.96 km length.

On 9.12.2005 one Starred Question and one Unstarred Question were raised. In the Starred Question, Shri Ilyas Azmi desired to know state-wise details relating to Government's proposal to connect all the villages with more than 1000 population with roads by the end of 2006; the problem and reasons for excessive delay in sanctioning the proposals; the steps taken/proposed to be taken to ensure that the proposals are not held up due to administrative delay; and the time by which all these villages will be connected. In his reply, M(RD) stated that the 'Rural Roads' component of Bharat Nirman Programme has a goal to provide connectivity to all habitations with a population of 1000 (500 in the case of hilly or tribal areas) and above with an all weather road by 2009. A statement indicating state-wise number of habitations to be covered under this programme was enclosed. In all 40436 habitations of 1000+ population and 26366 habitations of 500-999 population are to be covered. He further stated that it has been ensured that there is no undue delay in clearing proposals if they are complete in all respects. The steps taken to ensure timely clearance included sensitising the state implementing agencies, furnishing technical advice, periodic review at his level etc. Further, an on-line monitoring system has also been put in place to track the status of proposals and to speed up project clearance.

In the Unstarred Question, seven members, Shri Shishupal Patle, Shri Mohd. Tahir, Prof. Mahadeoraoshiwankar, Shri Mohd. Shahid, Shri Ashok Kumar Rawat, Shri Narendra Kumar Kushawaha and Shri Munshi Ram desired to know



whether contract for construction of rural roads has been awarded for the current year; the percentage of state-wise completed works; the reasons for not completing the work; the state-wise details of evaluation of the percentage of construction work completed in respect of the roads sanctioned for the year 2004-05; the details of time frame that have been fixed for the completion of the construction works; the total length of the roads in kilometers for which construction work has been started during the current year; and the details of the construction of ongoing road projects which is likely to be completed during the current year. In reply, MOS(RD-P) stated that the responsibility of awarding contract for construction of rural roads rests with the states. Two statements were enclosed which indicated (a) State-wise percentage number of road works and percentage length of road works completed up to September, 2005; in all the total percentage indicated is 67.36 and 60.82 respectively. (b) Percentage number of road works completed and percentage length of road works completed in Phase IV of PMGSY in respect of 8 states, namely, Chhattisgarh, Haryana, Madhya Pradesh, Maharashtra, Mizoram, Nagaland, Orissa and Rajasthan. The overall percentage upto September 2005 was 13.30 and 18.00 respectively. Further, awarded works are to be completed within a period



of 9 working months, the construction period should not exceed twelve calendar months; this Ministry has been approving road works phase-wise, and not year-wise, and accordingly, the year-wise details of starting works are not maintained. It was also informed that the construction of ongoing phase IV project is not likely to be completed during the current year as completion of road works depend on the time of starting the work and other constraints like adverse



weather conditions, availability of materials, contracting capacity etc.

On 13.12.2005 Shri Prabhunath Singh, tabled Calling Attention Motion regarding the need to look into the progress of implementation of Pradhan Mantri Gram Sadak Yojana in Bihar and steps taken by the Government in this regard. In reply M(RD) stated that in Phase I and II, 969 road works of 2219 kms length amounting to Rs. 452 crore were cleared; a sum of Rs. 359.90 crore has been released, 463 road works having 1157.90 km length have been completed with an expenditure of Rs. 298.05 crore. The reasons for appointment of five NEAs for implementation of PMGSY in Bihar were also furnished. The progress of works achieved by these agencies is 252; number of road works valued at Rs. 723 crore for a length of 2391 kms has been cleared; 4 road works for a length of 34.29 km completed; work of 130 road works for a length of 1208.77 km is in progress; tenders have been invited for 65 road works for a length of 521 kms; tendering for 52 road works for a length of 515 km is in progress; detailed project reports for 328 number of road works for a length of 2877 km are under preparation and scrutiny. Dr. Singh also stated that the progress of works is being reviewed regularly and the state Government has been requested to (a) prepare supplementary proposals for the missing links; (b) early finalization of the Core Network, CNCPL/CUPCL and (c) finalize the Action Plan to provide all weather connectivity to 9956 eligible habitations and for upgradation of 9295 kms under Bharat Nirman.

On 16.12.2005 two unstarred questions were raised. Shri Brajesh Pathak and Shri Mohd. Muqeem desired to know



state-wise details and nature of complaints received particularly from Uttar Pradesh under PMGSY during the last



three years and current year, the details of action taken on each such complaint; and the directions issued and steps taken for strict compliance of the guidelines meant for PMGSY. In reply, MOS(RD-P) stated that "Rural Roads" being a state subject, the State Governments are primarily responsible for ensuring proper implementation of the PMGSY. Complaints/suggestions are forwarded to the state Governments for taking appropriate remedial measures.

Shri Sugrib Singh desired to know the states and projects identified for assistance from ADB and WB resources during the last three years; the loan agreement signed with ADB and WB so far; the assistance received by each of such states; and the state-wise progress of such projects. In reply it was stated that during 2004-05, the WB has approved a credit/loan worth US \$ 399.50 million for funding the World Bank Tranche I Project of PMGSY in Himachal Pradesh, Jharkhand, Rajasthan and Uttar Pradesh. Similarly, ADB has approved a loan worth US \$ 400 million for funding PMGSY in Madhya Pradesh and Chhattisgarh under RRSP-I. Second tranche of WB support worth US \$ 500 million has been proposed to cover Bihar, Uttaranchal and Jammu & Kashmir. ADB has agreed to provide RRSP-II worth US \$ 750 million for Assam, Orissa and West Bengal. The details of the value of project proposals cleared and the amount released was also given, state-wise.

On 23.12.2005, six Unstarred Questions were raised. Shri Sushil Kumar Modi desired to know the state-wise number of engineers associated with PMGSY who were killed during the last three years; and details of the security provided to the engineers of the agencies engaged in construction of roads. In reply, it was stated that 'Rural Roads' is a state subject and

PMGSY is implemented by the state governments; no report has so far been received regarding killing of any engineer associated with execution of PMGSY; the responsibility of engaging engineers and their security is with the states. Further, the information on the number of engineers who have been provided with security by the states for road works under PMGSY is not maintained at the central level.

Shri J.M. Aaron Rashid, Shri Avtar Singh Bhadana and Dr. Rajesh Mishra desired to know the amount collected from each state by cess of Re.1/- per litre on diesel during each of the last three years; and the state-wise amount allocated for providing connectivity to new habitations in rural areas and improvement of Through Routes of Core Network of rural roads during the said period. In reply it was stated that state-wise data on collection of cess on diesel is not maintained. The cess collected on diesel for the years 2002-03, 2003-04, 2004-05 and 2005-06 is Rs. 4074 crore, Rs. 5966 crore, Rs. 7441 crore and Rs. 3472 crore respectively.

A statement indicating the amount released to the states from the share of cess earmarked for construction/upgradation of rural roads under PMGSY during the last three years was also enclosed. In all, during 2002-03, 2003-04, 2004-05 and



2005-06, funds released to the states were Rs. 2469 crore, Rs. 2288.27 crore, Rs. 2105.65 crore and Rs. 2349.25 crore respectively.

Shri Uday Singh desired to know the details of rural road projects sanctioned under Phase-IV of PMGSY proposals; details of construction of rural roads in states that have been assigned to several central agencies; and the state-wise



progress of rural roads in the PMGSY till-date. In reply MOS(RD-P) stated that PMGSY is under implementation since 2000, in Phase IV project proposals for 6661 number of road works with road length of 22885.96 kilometers, amounting to Rs.4804.28 crore have been cleared. In view of the slow progress of PMGSY work, Bihar Government requested this Ministry to engage certain central agencies. After consultations, tripartite agreements have been signed by Government of Bihar, this Ministry and four central agencies, namely, M/s. IRCON International Ltd., M/s. NBCC Ltd, M/s. NHPC Ltd., and M/s. NPCC Ltd. 33 districts in Bihar have been assigned to these Agencies. Agreement has also been reached with CPWD. 4 districts have been assigned to CPWD. These Agencies have mobilized and have commenced the implementation process. Similarly, an agreement has been signed by Government of Tripura, this Ministry and M/s. NBCC Ltd., for execution of PMGSY works in some districts in Tripura. The state-wise progress of rural roads since the inception of the PMGSY was also annexed, which indicated that proposals worth Rs. 20995.75 crore have been approved, a sum of Rs. 14132.77 crore has been released; utilization of funds is Rs. 11033.53 crore.

Shri Uday Singh desired to know details of the allocation of resources collected from the imposition of cess on petrol and diesel for development of rural infrastructure; and the state-wise distribution of such resources during 2003-04, 2004-05 and 2005-06. In reply, MOS(RD - P) stated that the cess collected on diesel accrues into the Central Road Fund, which is governed by provisions of the Central Road Fund Act, 2000. As per the provisions of this Act, fifty percent of the

cess is allocated for the development of rural roads. A statement was also annexed which indicated the amount released to the states during 2003-04, 2004-05 and 2005-06. For the years 2003-04, 2004-05 and 2005-06 the total amount released was Rs. 2288.77 crore, Rs. 2105.65 crore and Rs. 2349.25 crore respectively.

Shri Braja Kishore Tripathy desired to know the details of PMGSY proposals recommended for clearance in respect of Orissa; the details of funds released till September, 2005 and the details of the physical/financial progress including proposals cleared for 2004-05 and 2005-06. In reply it was stated that for Orissa, 2880 road works valued at Rs.2240.95 crore for a length of 9514.74 kms, benefiting 4463 habitations have been cleared and Rs.974.79 crore has been released. Further, 1402 road works of 3884 km. length have been completed and Rs.812.59 crore has been spent under PMGSY.

Shri Sugrib Singh desired to know the state-wise details of additional allocation of funds for PMGSY on account of increase in diesel cess during the last three years; whether there was delay in allocation of cess; if so, the steps taken for timely disbursement of additional allocation to states. In reply MOS(RD - P) stated that the cess collected on diesel accrues into the Central Road Fund, which is governed by the provisions of the Central Road Fund Act, 2000. As per provisions of this Act, fifty percent of the cess on high speed diesel is allocated for the development of rural roads; release of funds to the states depends upon the level of utilization of funds released earlier and the physical progress of works. There has been no delay in allocation of cess.



#### RAJYASABHA

On 23.11.2005, three Unstarred Questions were tabled. Prof. M.M. Agarwal desired to know the district-wise and Panchayat-wise number of villages in the states of Uttar Pradesh, Rajasthan, Orissa, Bihar, Madhya Pradesh and North Eastern Region which have not been connected with the city roads, and the time by when all the villages of these states will be connected with the city roads. In reply, a statement was annexed which indicated the district-wise number of unconnected habitations eligible for coverage under PMGSY, after construction of road works already approved for the states of Uttar Pradesh, Rajasthan, Orissa and Meghalaya. MOS(RD-P) also stated that the remaining states have been advised to reconcile the information according to 2001 Census and that this Ministry does not maintain Panchayat Level information. The objective of PMGSY and targets fixed under Bharat Nirman were also explained.

Shri S.S. Ahluwalia desired to know the present status of implementation of the PMGSY; year-wise details of roads constructed vis-à-vis targets under the programme in rural areas duly indicating the names of the states and the type and length of roads constructed; the details of work started under the programme but not progressed since 2003-04; the reasons for lack of their progress; the time-schedule drawn for completion thereof; and the impact in terms of cost of delayed implementation of these projects. In reply, MOS(RD-P), while enclosing a statement indicating the state-wise, phase-wise (2000-01 to 2005-06) physical and financial progress in the construction of all-weather roads under PMGSY, stated that the lack of adequate progress in some

states is mainly due to adverse climatic conditions, delay in forest clearance, land dispute and inadequate execution capacity of the states. It was also stated that the PMGSY guidelines stipulate that the works are to be completed within 15 months after the clearance of the projects by the Ministry and the cost escalation, if any, due to whatever reason, is to be borne by the State Government concerned.

Smt. Pramila Bohidar and Shri B.J. Panda desired to know whether the PMGSY has hit a mega speed breaker in a number of states countrywide and the roads are ridden with potholes/pitfalls; if so, what is plaguing the system; the position of Outcome Budget; status of Orissa and the action plan to help the state to overcome the impediments coming in the way of speedy implementation of the project. In reply, MOS(RD-P) stated that for the first quarter the target was to cover 2220 habitations involving 4995 km of road length against which 2461 habitations involving 6927 km of road length has been achieved. For the second quarter, the target was to cover 1481 habitations with 3200 km of road length and the achievements are 1567 habitations with 3697 km road length. The status in respect of PMGSY in Orissa indicated was: 2149 number of road works were approved



against which 1402 were completed; percentage of road works completed being 66%. It was also indicated that 6417.92 km of road works was approved, out of which 3884 km of road works were completed; percentage of road works completed being 61%. Further, it was stated that Orissa has been identified as one of the states to be assisted by the ADB. Under 'Bharat Nirman', it is proposed to construct 9993 kms of new roads connecting 4447 habitations and upgradation





of 14161 kms by 2008-09. The road works for Phase-V for a length of 1907.65 km and 1189.17 km under ADB funded projects have been cleared and these works are likely to be awarded shortly. The state is required to enhance its capacity to undertake such volume of work within the stipulated time frame.

On 30.11.2005 four unstarred questions were raised. Shri S. Anbalagan desired to know the steps taken for the state-wise development/implementation of rural roads in the country during the last two years, the details of allocation of funds for the purpose for the last two years and the results achieved thereon; the details and reasons if the country still lags behind many countries in development of rural roads; and the steps proposed to be taken thereon. In reply, MOS(RD) stated that the 'Rural Roads' is a state subject. The construction of roads has been taken up by the State Governments in accordance with the PMGSY guidelines. The objective of PMGSY is to provide connectivity to all Unconnected Habitations in the rural areas with a population of more than 500 persons (250 persons in the case of North Eastern states, Hill states, Desert and Tribal (Schedule-V) area) by the end of the Tenth Plan period. To speed up the rural road connectivity, a Rural Road component has been included in the Bharat Nirman which has a goal to provide connectivity to all villages with population of 1000 (500 in the case of Hilly or Tribal areas) with all weather roads by 2009. A statement was also annexed giving state-wise release of funds and length of roads constructed under the Programme. In totality, Rs. 14094.26 crore were released and 77455.72 km length of road constructed. A number of measures have been taken to enhance the project implementation capacity at the State and District levels. These include preparation of District Rural Roads Plan, Core Networks, publication of the Book of Specifications and the Standard Data Book, Formulation of the Standard Bidding Document, outsourcing of technical inputs and training of the engineering personnel involved in the process of execution of the road works. This Ministry regularly reviews the progress of work.

Shri Ajay Maroo desired to know the amount provided to the state of Jharkhand under PMGSY, its utilization; details of directions issued by the Central Government to the state Government in this regard. In reply, MOS(RC-P) stated that an amount of Rs.421.88 crore has been released to Jharkhand, out of which Rs.371.22 crore has been utilized till September, 2005. The State Government has been advised to accelerate the pace of implementation of the programme.





Shri Thanga Tamil Selvan desired to know the number of habitations connected through PMGSY since its inception; the total population benefited; the total state-wise financial allocation during the last 3 years till date; time frame fixed to



connect all the habitations which have not been covered till recently, the details of the proposals to extend this scheme to those habitations with below 500 population and if not, the reasons thereof. In reply it was stated that about 22000 habitations have been connected through PMGSY; 13861 habitations with population of 1000 and above, 6340 habitations with population of 500-999 and 2169 habitations with population of 250-999 have been connected under the Programme so far. Further, a statement was annexed which indicated the state-wise funds allocated to the states during the years 2003-04, 2004-05 and 2005-06. In totality, during 2003-04, 2004-05 and 2005-06, Rs. 2220 crore, Rs. 2220 crore and Rs. 3480 crore respectively were allocated to the states. The objective of the PMGSY was also explained. It was also stated that the Rural Road Component of 'Bharat Nirman' has a goal to provide connectivity to all villages with population of 1000 (500 in the case of Hilly or Tribal areas) with an all weather road by 2009.

Shri Surendra Lath desired to know the amount released to Orissa during the year 2004-05 under PMGSY; the number of schemes completed and the status of the incompletd schemes; whether the amount released has not been spent properly because Central Government does not have any

rational monitoring scheme; and if so, steps being taken by Central Government to put in place a rational system of monitoring and scrutinizing. In reply MOS(RD-P) stated that during 2004-05, Rs.178.75 crore was released to Orissa. 364 road works for a length of 752.52 kms. have been completed during 2004-05. Upto Phase-III, 1722 road works were cleared, out of which 1401 road works have been completed. This Ministry has put in place OMMAS for monitoring the programme.

On 07.12.2005 three Unstarred Questions were tabled. Smt. Sushma Swaraj desired to know the funds allocated to Bihar under PMGSY and the details of roads constructed under the said scheme during the current year. In reply it was stated that under PMGSY the annual allocation for Bihar is Rs.332.00 crores in the current financial year (2005-06). The Government of Bihar has engaged five Executing Agencies like M/s. NBCC Ltd., NHPC Ltd., NPCC Ltd., IRCON International Ltd., and CPWD for execution of PMGSY. So far 246 road works for a length of 2238.64 km valued at Rs.689.08 crores have been approved by the Ministry. 130 road works for a length of 1208.77 km. are in progress by these agencies. The agency-wise details were given in the Annexure enclosed with the reply.

Shri Hari Rawat desired to know the number of roads in rural, hilly and far-flung areas in Uttaranchal being constructed,





district-wise and panchayat-wise, under the PMGSY, road-wise; and the total funds allotted and utilized for the construction of these roads during the last three years in this state. In reply it was stated that 'Rural Roads' is a state subject. The responsibility of construction of roads under PMGSY lies with the states. This Ministry does not maintain district-wise, panchayat-wise and road-wise information on road works taken up by the states. This Ministry has approved a total of 290 road works over a length of 1811.87 kms at a cost of Rs.360.83 crore. Further, against total allocation of Rs.395 crore to Uttaranchal upto 2005-06 for PMGSY, an amount of Rs.201.04 crore has been released against which an expenditure of Rs.129.92 crore has been incurred.

Shrimati S.G. Indira desired to know the details of the meeting of Rural Development Secretaries convened by the Government regarding slow implementation of the PMGSY; and the details of the said scheme which provides full central assistance to the states for constructing and upgrading rural roads. In reply it was stated that a meeting to review the implementation of PMGSY in the states was held under the chairmanship of Union Minister of Rural Development on 3<sup>rd</sup> December, 2005. In this meeting, representatives of all the State Governments, except, Goa, participated. The programme aims at providing connectivity by way of an all weather road to the eligible unconnected habitations in the rural areas. Under Bharat Nirman goal has been set to

provide connectivity to all the habitations with a population of more than 1000 in the plain areas and habitations with the population of 500 or more in hilly and tribal areas by 2009-2010. The programme also provides for upgradation of existing rural roads subject to the prescribed conditions. The details of the programme coverage (upto September, 2005) were also given, which is, that there are 1.72 number of eligible habitations, 368000 kms of length is to be upgraded, a sum of Rs. 1,32,000 crore is required; proposals valued at Rs. 24850.76 crore have been cleared and a sum of Rs. 14253.54 crore has been released. Number and length of road works approved are 45643 and 144446.61 kms respectively. Expenditure incurred is Rs. 11151.84 crore, so far 28199 number of road works have been completed; road length completed being 77718.31 kms.

On 14.12.2005, 1 Starred Question and 5 Unstarred Questions were raised. In the Starred Question, Shri Vijay J. Darda desired to know about 15 states which are lagging behind in the PMGSY; the states and the year from which they have not claimed their share of funds; and why such lapses were not detected through annual review meetings held from time to time. In reply M (RD) annexed a table indicating year-wise allocation and release of funds to states under PMGSY, and stated that 19 states have not taken their full allocation upto the current year. These states have not been able to take their full allocation due to inadequate institutional





arrangements, limited contracting capacity, delay in obtaining forest clearance / land availability etc. The review meeting with states, taken at regular intervals, at various levels focus on such issues and are intended to facilitate the states to improve their absorption capacity and accelerate the pace of works.

Shri Dharam Pal Sabharwal vide Unstarred Question desired to know as to the year-wise amount by way of cess of Re.1/- per ltr. on diesel which has been collected from Punjab during the last five years and the amount allocated to the state, year-wise for providing connectivity to new habitations in rural areas and improvement of routes of Core Network of rural roads. In reply it was stated that the Government does not maintain state-wise data on collection of cess on diesel. The amount allocated to Punjab for development of roads by providing new connectivity to unconnected habitations and upgradation of road works under PMGSY, is Rs. 25 crore for each of the years from 2000-01 to 2004-05 and Rs. 30 crore for the year 2005-06.

Shri Dilip Sing Judev desired to know about any provision in PMGSY to construct new roads by including the roads constructed earlier by PWD and other Government agencies; the length of roads in kilometers constructed during the last three years under PMGSY in Chhattisgarh, Bihar, Jharkhand and Orissa after the acquisition under this scheme, together with the area of acquisition; provisions made for construction of new roads after the acquisition; and if there are no provisions for acquisition, the state-wise details of the action

taken against the officers involved in construction of such roads. In reply it was informed that PMGSY envisages construction of new roads to unconnected habitations and up-gradation of the existing Through Routes, earlier constructed by PWD and other Government agencies, if such Through Routes are part of the core-network prepared for the districts concerned and meet the eligibility norms prescribed in the programme guidelines. Further, 'Rural Roads' is a state subject. The responsibility of providing land, free of encumbrances, for construction of roads under PMGSY rests with the State Government concerned. Acquisition of land is not covered under PMGSY. Therefore, this Ministry does not maintain information on issues relating to acquisition of land for PMGSY works.

Shri Lekhraj Bachani desired to know about the request made by Government of Gujarat for allocation of more funds and upgradation for PMGSY; whether Gujarat has been put in a disadvantageous position as allocation of grant is on the basis of habitations remaining to be connected; whether as a result, these roads are not near the standard envisaged in the PMGSY; and whether Government would give allocation weightage during allotment of amount to state. In reply, while affirming the request received from Gujarat, it was stated that PMGSY aims at providing connectivity to hitherto unconnected habitations with designated population size in the country. Keeping this objective in view, priority is given to New Connectivity to unconnected habitations, over upgradation of existing roads, and accordingly, funds are allocated. Modification of this principle would adversely





affect the objective of the Programme. The technical specification of the roads which are not under PMGSY could be different from the specification adopted for the PMGSY road works.

Shri Raj Nath Singh desired to know about the condition of Pauri Satyakhal-Bara-Dehalchauri motorable road in District Pauri Garhwal of Uttaranchal which was constructed ten years ago; due to which thousands of rural people are facing inconvenience in reaching



Headquarters; and whether the Government proposes to issue necessary guidelines for metalling these roads and the time by when this road would be metalled. In reply it was stated that the Pauri Satyakhal-Bara-Dehalchauri road was originally constructed as Light Vehicle Road (LVR) by the State Public Works Department under the state sector. The total length of this road is 23 kms. Under Phase-I (2000-01) of the PMGSY, 5.50 kms of this road was sanctioned for widening and upgradation. This work has been completed up to premix stage. It was further stated that the remaining length of this LVR is still kachcha. The State Public Works Department has sanctioned metalling of 3.00 km of this road from the State Sector. The work is under progress. The State Government has further intimated that the estimates for widening and metalling of the remaining length of this road have been sent by the State Public Works Department to the Government of Uttaranchal for sanction under State Sector.

Shri Santosh Bagrodia and Shri Harish Rawat desired to know the details of the states which failed to (a) claim their share of funds from the Centre under PMGSY (b) spend the amount released to them; the state-wise details of villages with population of over 1,000 not connected with roads; and the steps taken to make PMGSY successful. In reply, a statement was annexed which contained state-wise details of funds allocated to states, releases and total expenditure reported by the states up to the year 2005-06 under PMGSY, since inception. In totality, as against allocation of Rs. 14940 crore, a sum of Rs. 14489.17 crore was released and an expenditure of Rs. 11135.66 crore has been incurred. Another table was also annexed which indicated the number of habitations with

population of over 1,000, which are yet to be cleared by the Ministry for coverage under PMGSY, in each state; the total number being 34680. It was further stated that the Ministry has adopted a multi-pronged strategy to achieve the goals of PMGSY. This includes technical support to the implementing agencies, capacity enhancement, workshops to sensitize the stakeholders on the measures to overcome the existing constraints and need for attitudinal changes,

regular reviews with states, timely release of funds to the states, strengthening quality monitoring etc.

On 21.12.2005, two Unstarred Questions were tabled. Shri Nandi Yellaiah desired to know about the proposal sent by the Andhra Pradesh Government for leveraging the annual allocation of PMGSY for Rs. 900 crores; the response of the Central Government thereto; the reasons for inordinate delay in clearing the proposal; and the time by when this request may be approved. In reply it was stated that the Central Road Fund Act does not provide for leveraging of the Cess to raise resources for construction and maintenance of rural roads by the State Governments.

Shri Sharad Yadav desired to know the district-wise and panchayat-wise number of villages in Bihar which have not been connected with the city roads; the details of any scheme under the Government's consideration in this regard and the time by when all the villages of the state will be connected with city roads. In reply MOS (RD -P) stated that based on the provisional Core Network, prepared by the Government of Bihar and the progress already achieved, there are 9956 unconnected habitations with population of over one thousand and 6203 habitations with population of over 500 in Bihar. Under 'Bharat Nirman', target has been set to connect all these habitations with an all weather road by 2009. About 18946 kilometres of road would be constructed for providing new connectivity to these 9956 habitations with population of over 1000. Besides, 9295 km of road is targeted to be upgraded under 'Bharat Nirman' by 2009 in Bihar.



## Low Cost Concrete Road for Villages

Dr B.B. Pandey, Emeritus Professor of Civil Engineering, IIT Kharagpur

A bituminous road is damaged fast in high rainfall areas due to poor drainage conditions, while a gravel road becomes dusty, causing safety and health problems due to a cloud of dust raised by motorised traffic, which is increasing by leaps and bounds. Problems of dust and wet weather damage to roads can be easily overcome by constructing a thin flexible concrete road using innovative technology at a cost lower than that of a bituminous pavement for equal traffic. The surfacing layer of concrete can be as thin as 50mm for a low volume of traffic, to about 100mm for about 50 commercial vehicles per day. The paper describes construction of a road in the village Rakhalgaria, close to IIT Kharagpur, using the new technology.

The existing road had a formation width of 3.50m and the road crust consisted of murrum/laterite boulder of 100mm average thickness. The CBR of the subgrade was found to be 5 and the region has an average annual rainfall of 1500 mm. The daily traffic consisted of about 30 iron-rimmed bullock carts, 3 to 5 trucks carrying building material, 20 three wheelers, 30 motorcycles and 100 bicycles per day. The village has a primary school and fairs are held twice a year with plenty of commercial activities.

Formation width was widened to 5.5m and a carriageway width of 3.75m was adopted. A camber of 3.0% over the subbase was provided by compacting murrum over the existing murrum surface. An edge restraint of brick on end edge was provided on either side of the compacted



Fig 1 Murrum subbase with brick on end edge along the pavement edge

subbase(Fig 1). A form work of cells of plastic sheets is laid across the full width of the subbase so that a grid of square cells with sides 150mmX150mm and depth100mm is formed (Fig.2). The formwork is kept under tension.



Fig 2 Formwork of plastic cell being spread

A cement concrete of nominal mix 1:1.5:3 by volume, with a water content of about 6% was filled into the plastic cells (Fig. 3). The concrete had zero slump. The 28 day strength was found to be 27MPa. The concrete was rolled with a plate



Fig.3 Placing of concrete in plastic cell

compactor (Fig.4) but a vibratory road roller can be used for faster construction. The concrete was cured for two weeks by using wet paddy straw, but light traffic such as motor cycles, bicycles, autorikshaw etc were permitted to ply after 24



Fig. 4 Compaction of zero slump concrete by a plate vibrator

hours. Fig.5 shows the road surface after removal of paddy straw.



Fig 5. A finished surface of the concrete road after removal of paddy straw used for wet curing

The pavement was evaluated by Falling Weight Deflectometer (Fig. 6) using a dynamic load of 45kN on

300mm diameter plate. The equivalent elastic modulus of the 100mm compacted flexible concrete was about 4500



Fig 6 Evaluation of pavement by FWD

MPa, three times the modulus of high strength bituminous concrete used in major highways. Its expected life is 15 to 20 years. The cost of 250m long pavement with a hard shoulder of laterite boulder was found to be Rs.4.00 lakhs and the cost per kilometer is estimated as Rs16.00 lakhs .The entire cost was born by IIT Kharagpur. If CBR of the soil is 5 and above, no subbase is necessary. The students and scholars of Civil Engineering Department of the Institute were involved for quality control. The construction is labour intensive and it is in consonance with the employment generation scheme of the Ministry of Rural Development.

### Documenting Impact of PMGSY

Rural Roads connectivity promotes access to economic and social services to the rural masses. Rural Roads provide the best means of reducing poverty through sustainable development and social economic transformation of Rural India. It is evidenced that rural accessibility has a marked impact on agriculture, employment generation, industry, health, education and other areas.

NRRDA would like to systematically document the impact of connectivity being provided under PMGSY. Accordingly, we would welcome brief case-studies (preferably with digital photographs) depicting changes brought about by the programme in the socio-economic profile of the habitations benefitted. Articles, in MS Word (not exceeding 1200 words), may kindly be sent to:

Dr. B.P. Chandrasekhar, Director (Technical)  
National Rural Roads Development Agency  
5th Floor, NBCC Towers, Bhikaji Cama Place, New Delhi-110066  
Phone No: 011-41055550 (O), Fax No: 011- 41000475 (F),  
Email Id: bpc@nic.in



## Bharat Nirman – Opportunities and Challenges

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

India's Road Network consists of about 65600 km of National Highways, 64200 km of State Highways and Major District Roads and about 2.7 million km of Rural Roads. About 70% of India's population lives in rural areas. Nearly 40% of rural habitations are not connected to all-weather roads (3.3 lakh out of 8.25 lakh habitations). Many villages still rely on earth tracks that are unsuitable for motorized traffic and become impossible during rainy season. Even where an all-weather connection has been provided in the past, the standard of rural roads is low, maintenance is poor and many roads are in need of improvement in carriage way width, geometrics, cross and longitudinal drainage and appropriate crust thickness. Poor connectivity is well known to have high correlation with illiteracy and poverty. Therefore, as an effective Poverty Alleviation Strategy, Pradhan Mantri Gram Sadak Yojana (PMGSY) was launched in the year 2000. The objectives of the Programme is to provide all-weather connectivity to all habitations of 500 and above population (250 and above for hilly, desert and tribal areas) in a definite time frame.

Pradhan Mantri Gram Sadak Yojana is a nationwide Rural Road Programme managed at the Central level by the



National Rural Roads Development Agency (NRRDA), an agency of the Ministry of Rural Development (MoRD), Government of India. The Programme is implemented by the State Governments through dedicated State Rural Road Development Agencies (SRRDAs). While the MoRD, through NRRDA, lays down the general technical and management standards and provides the funding, the design and







execution is done by the SRRDAs and their district level Programme Implementation Units (PIUs) who are also responsible for managing the work contracts and funds.

Based on the data furnished by the States, 365,805 km of road length is required to be constructed to connect 172,772 eligible habitations at a cost of about Rs.78,000 crores. Another 372,816 km of road length is required to be upgraded benefiting 157,875 habitations. Estimated cost of upgradation is about Rs. 54,000 crores. The source of funding for the Pradhan Mantri Gram Sadak Yojana is a cess on diesel accrued into the Central Road Fund (CRF). The management of the CRF is governed by the provisions of the CRF Act 2000, in particular, Section 9 and 10. To speed up the pace of construction, additional funding from the World Bank and the ADB has been arranged for 9 Core States, where the level of unconnectivity is highest. Proposal to leverage future cess on diesel is also under active consideration of the Government. Since launching of the PMGSY in 2000, considerable progress has been made in the field of formulation of District Rural Road Plan (DRRP) and the core network, identifying and serving as the basic instrument for prioritization of construction and allocation of funds for maintenance. Rural Roads Manual, Book of Specification and the Standard Data Book, Standard Bidding Document, Computerized and Online Management Monitoring and Accounting System (OMMAS) have been developed and put in use and are providing a sound technical base to the programme. To build up capacity and capability, training needs have been identified and personnel from SRRDAs are being trained in different aspects of the programme. Contractor's engineers and workmen are also being covered under the training scheme.

#### Bharat Nirman- Rural Roads

To upgrade rural infrastructure, the Government of India has conceived a time-bound business plan under Bharat Nirman. It is a flagship programme for the country. A commitment of over Rs. 1,74,000 crores has been made to Bharat Nirman with the objective of unleashing the growth potential of our villages. As part of the programme, Government of India intends that, by end of financial year 2008-2009, every village of over 1000 population, or over 500 in Hilly and Tribal areas, has an all-weather road.

#### State-wise Targets

To achieve the targets of Bharat Nirman, 1,46,185 kms. of road length is required to be constructed by 2009. This will benefit 66,802 unconnected eligible habitations in the

country. To ensure full farm to market connectivity, it also targets to upgrade 1,94,132 kms. of the existing Associated Through Routes. A sum of approximately Rs. 48,000 crores is proposed to be invested to achieve this. Based on core network data furnished by the State, targets for each State have been identified and action plan prepared.

#### Opportunities

This initiative of Government of India provides an unique opportunity for faster socio-economic development by way of providing single all-weather connectivity to target habitations in a time-bound manner. Performance based monitoring, based on the physical outcomes, in terms of kilometrage of the roads completed and habitation



benefited, has also been introduced. This entails assessing the performance quarterly. Bharat Nirman unfolds an unprecedented field of opportunities:

- To create Core Network of roads in Rural India.
- To build roads meeting prescribed Design, Specifications and Quality parameters.
- To address location specific problems and optimally use local resources by innovation and experimentation.
- To upgrade Project Management capacity and capability of Implementing Agencies.
- To evolve a framework for community participation in planning and implementation.
- To institutionalize community ownership of roads.



### Challenges

Though a sound technical and management base has been created through enabling measures taken since launching of the Programme in December 05, the task ahead is a gigantic one. This is amply clear if we compare the achievements in term of habitations connected, kilometrage of road length constructed or upgraded and the financial investment made upto March 05 and required between 2005-09.

Particulars	Achievements	Targets
	2000-05	2005-09
Habitations	36,000	66,802
Length km	67,000	1,46,000 NC Plus 1,94,000 UG
Financial Investment (Rs. Cr.)	13,000	48,000

This has thrown up challenges which can be broadly categorized under following categories:

Executional Capacity at the State level and at the District level

The turnover at the State level is expected to be 3 to 4 times than what has been executed during the last few years. By streamlining the procedures and setting up of a sound technical base, as well as training, it is anticipated that output would generally be higher. However, in case the available capacity is not sufficient, some of the activities at the PIU

level may have to be outsourced to Project Implementation Consultants, particularly for the State where the balance volume of work is large. This is considered prudent, as it does not add to the permanent work force in the executing agency and also is able to make use of expertise available in the private sector.

Getting works executed through eligible Central Public Sector Undertakings could be another way of outsourcing of activities. This enables use of technical and management expertise available with PSUs for implementation of the Project and can be a substitute for PICs to some extent. This





would be more useful to States which do not have a full-fledged executing agency - though cost implications are somewhat higher compared to outsourcing part of activities to PICs.

#### Contracting Capacity

With an increase in volume of work the contractors are also required to upgrade and enhance their capacity. This is possible by deployment of more machinery, engineering and managerial staff, as well as, training of personnel and workmen. In the bidding document of PMGSY there is a provision to invite tenders under the two envelopes system and the contractor is required to have certain executional experience, financial capacity and the experience of having executed works of similar nature. The 'available bid capacity' would increase only when the contractor is executing the works at a faster pace so that his capacity becomes free to take up further works.

There is also a need to involve bigger construction agencies with a larger package size.

#### Use of Appropriate Technology

The Rural Roads under PMGSY are envisaged to be carried out using intermediate technology. That is to say that if a work can be done economically and effectively employing labor, use of machinery should be avoided. However, for certain activities in road construction such as carriage of material, compaction, bituminous mix etc. use of machinery cannot

be avoided. Adoption of locally available machinery, such as tractor with a few attachments and or modification is being encouraged.

#### Social and Environmental Concerns

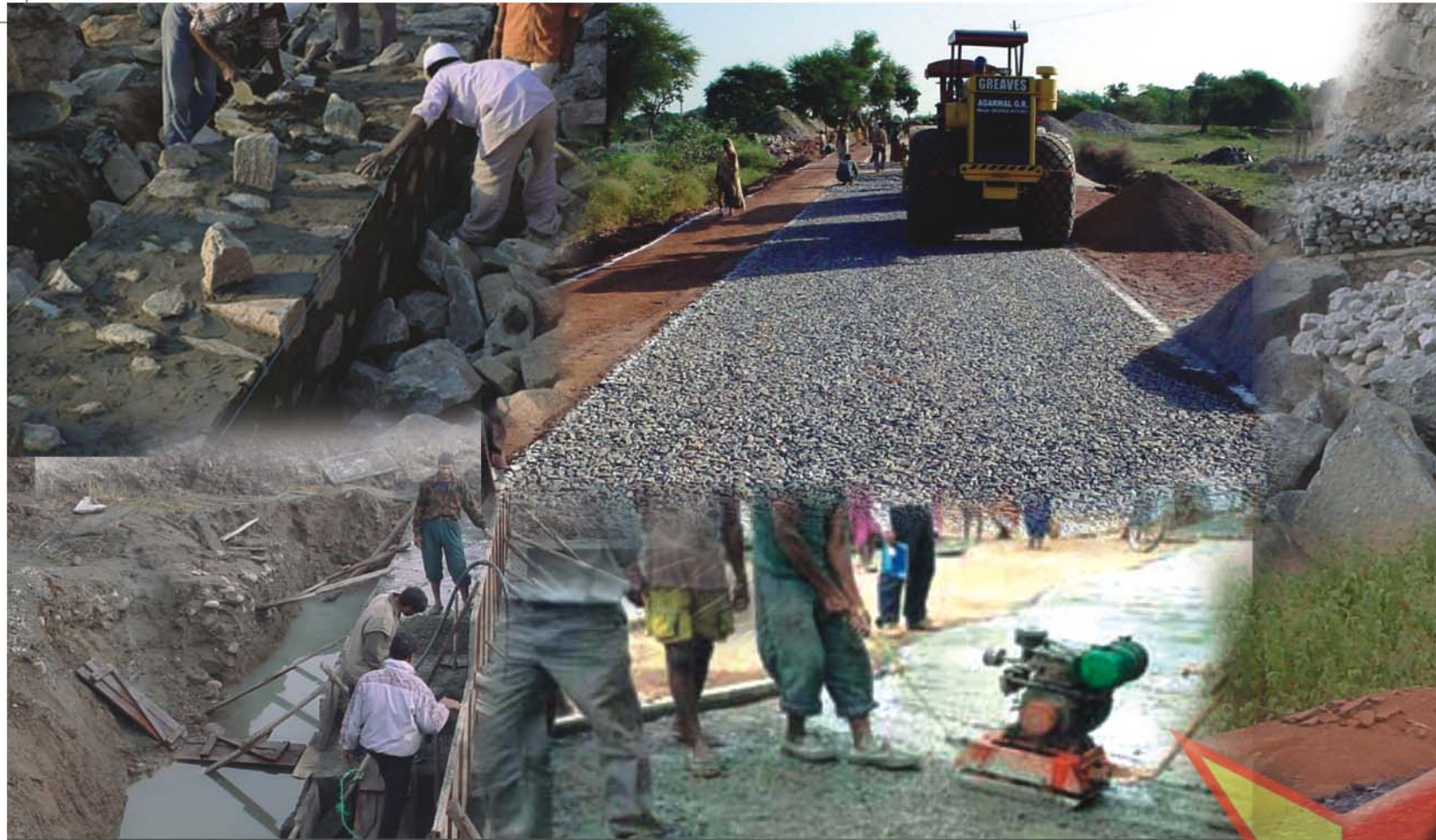
Though the programme is expected to improve the economic and social welfare of people, care is also been taken so that the position does not become worse than what it was before the programme was undertaken as far as social and environmental issues are concerned. Impact on environment studies and guidelines have been issued so that least quantum of land is utilized (to avoid displacement of people and use of agricultural land), pollution to soil, air and water is reduced, the water bodies are not disturbed and the hill slopes are protected.

#### Use of New Technology and Materials

The increase in construction activities are bound to increase the requirement of road construction material. Particularly in the hill areas a lot of waste is expected to be generated by way of cutting of hills. Pilot projects are being undertaken to encourage use of low quality materials as well as increasing



the structural capacity of the locally available soil by using soil stabilization techniques. Soil stabilization is expected to result in lower structural thickness of the pavement steps taken to meet the challenge, reducing the requirement of stone aggregates. Such measures would not only optimize the cost but also reduce the time of construction.



# Good Examples in Ru





# Rural Road Making





## PMGSY – Call for Quality

*D. L. Vaidya, National Quality Monitor*

With the advent of the First Five Year Plan, the country entered into a phase of planned development. Basic infrastructure required for the all round development was a sustainable network of roads. The country had just attained Independence



and the need of a welfare state was different from the objectives of the British Empire. India lived in its villages and it was obligatory for the planners to dedicate efforts for their alleviation. Much was done but much more was needed to afford these villages all-weather connectivity to the market places. Several programmes were launched for the construction of rural roads but the result of a sustainable network eluded the planners.

In the din of quantitative achievement quality became a casualty. The number of construction agencies kept on increasing and diluted the role of experts in the task of rural road construction. We got roads but necessarily not fulfilling the needs of the area. The status of links to the village was far from being satisfactory. The pace of connectivity was also not to the desired level.

Development of infrastructure of road network came to the fore when the country started liberalizing its economic policies, aimed at becoming an active partner in the global trade. The country is now witnessing an unprecedented involvement in this process and connectivity to villages has been adopted as a national programme. PMGSY came into being and it is now one of the components of Bharat Nirman.

National Rural Roads Development Agency was established to adopt and enforce quality standards through well-meaning specifications. The task was stupendous as the executing agencies had not been quality conscious all these years for rural roads, maybe due to the thrust for quantitative

achievements. Guidelines have been detailed for the executing agencies and a strong quality monitoring system has been devised to see proper implementation of the programme. The results may be a matter of debate, but one thing is for sure, that active participation of engineers has been guaranteed and the execution of works has come out of the rut and has been put on the highway of engineering technology.

I had a chance to travel for inspections far and wide in the country and my experiences as a National Quality Monitor (NQM) have been more than satisfactory, if compared to the past experiences of rural road programmes. The norms for design of roads have been adopted on sound engineering practices. The consultancy for the same is with the engineering institutes of repute and may be described as the best in the market. The accent on quality must have upset the time-entrenched routine but initial teething problems seem to be over. It does not mean that the construction is being done totally on recommended norms but enough pressure has been generated through monitoring to adhere to these specifications and the results are positive.

I was amused by the statement of a young promising engineer that for the first time in his career, as an engineer, he was actually using his engineering knowledge. I was not at all surprised by his statement because hitherto road construction was deemed to be the job of a labourer with little or no involvement of a qualified engineer. That concept has been overhauled by the practice being followed in PMGSY. The feedback from the rural people is really encouraging-for the first time they are witnessing such a technical approach for rural road construction.



After inspecting about 419 roads in eleven states of the country, I would not hesitate to point out areas where the executing agencies need special attention. Construction of full



embankment width with proper slopes ensures not only an aesthetically good structure but one that is structurally sound too. Shoulders had been the casualty in roadway width but their construction simultaneously with road crust guarantees structural strength. It affords better compaction and hence better durability. Interlocking of coarse aggregates while compacting WBM layer is indispensable. A better approach in this regard, however, will bear sustainable results. This is required further while layering and it can be appropriately laid if an overdose of so-called binding material is avoided. The road crust will not behave as one if different layers are not properly interlocked. This will defeat the design requirement. I had the opportunity to see, during my tour in different parts of the country, the construction of State Highways and even National Highways being done without first completing the process of dry compaction, meant for interlocking the aggregates. Binding material is being used profusely with water, impairing the structural strength of the WBM course, which as a matter of fact, should be a filler or a binding agent to smoothen the riding surface, in order to avoid stripping of metal. Material with PI value of less than 6 may hardly have any binding characteristics. My observations prompt me to say that certain cross drainage works need special hydraulic consideration and that the generalized practice may be avoided, though cases of such nature are very small.

Mandatory tests before, during and after construction have lacked adequate attention from the contractors and the PIUs. The reason being that demand of these mandatory tests is quite heavy and the present set-up cannot meticulously meet the requirement. It is felt that DPR should provide for special provisions for quality control and obviously construction consultants can supplement the efforts to make it more responsive. It is a matter of great satisfaction to me as a NQM that invariably the thickness of various layers under construction and the constructed one have been checked and found to be in order. The quality of metal has also been found generally good.

PMGSY is the landmark programme for quality construction and I am sure that the others engaged in the task of rural development will emulate the same. The inertia for ignoring the quality aspect in construction of rural roads has been overtaken by the well-planned and well-thought of action plan by the NRRDA. I am sure the quality of rural roads in the country has received a tremendous boost and it is bound to surge ahead in time to come. However, I would stress on more accountability in maintenance and an assured mechanism for the same.



## Revisiting the First Tier of Quality Mechanism under PMGSY

**Prabha Kant Katare**, Chief Quality Coordinator and JD (PIII), NRRDA.

*The feedback on the first tier of QM has revealed that in a few States, on one hand, the field laboratories could not be properly established and QC tests could not be conducted because of their unrealistic frequency prescription, on the other hand, the inspection of works could not be carried out by the supervisory level officers also. In fact, because of weak supervision by the senior officers of the Executive Agency, the first tier of QM is not working in the manner it is desired. Such States have not been able to internalize the quality consciousness in works. As such, there is an urgent need to review the first tier of quality management mechanism under PMGSY.*

The Pradhan Mantri Gram Sadak Yojana is a mega national programme aimed at providing good all weather road connectivity in rural India. The implementation of this programme has already made its mark in the rural areas through its emphasis on methodical planning, attention to quality and time bound execution. The State Governments are responsible for implementation of this programme and as such it is their responsibility to ensure the quality of road works. However, since the programme lays special emphasis on the quality and timely completion of road works, a three tier quality management mechanism has been operationalised.

The standards for quality of works have been prescribed under the publication 'Ministry of Rural Development, Specifications for Rural Roads' published by IRC in August, 2004 (hereinafter referred to as Specifications). The comprehensive details about rural roads are provided in Rural Roads Manual IRC SP: 20, 2002. In order to provide

detailed guidance to field engineers about the tests and testing procedures, the NRRDA has published a Quality Control Hand Book (being revised by IRC) and for recording the test results, Quality Control Registers have been prescribed.

The first tier of quality management mechanism is envisaged as an in-house quality control system to ensure the implementation of quality standards by way of carrying out mandatory tests, however, the second tier is envisaged as an independent quality check and monitoring mechanism to be operationalised by the States. As the third tier, the National Rural Roads Development Agency (NRRDA) arranges for quality monitoring through independent monitors termed as National Quality Monitors (NQMs). The feedback has indicated that this tier is not working effectively in some of the States because of various reasons, with the result, effectiveness of the other two tiers also cannot be ensured.







### Provisions under the First Tier of Quality Management Mechanism

Quality is an integral part of Rural Road construction. Quality can be controlled by two methods, one is “Process Control” and the other is “Product End Result Control”. In the highways sector, only prescription of quality of end product and its control at the product level is not possible because the road consists of many items and within items many sub-items. Therefore, a combination of “Process” and “End Result” type of quality control is prescribed in the



specifications of the road works. Under PMGSY, quality standards have been prescribed under the specifications and enforcement of standards has been prescribed through the contract, wherein, the responsibility for carrying out mandatory tests has been entrusted to the Contractor under the supervision of the “Engineer”.

The Contractor is required to establish a field laboratory in every package for carrying out the mandatory quality control tests as prescribed in the specifications and also required to maintain the record of tests in prescribed Quality Control Register Part 1. It is not adequate to perform tests and

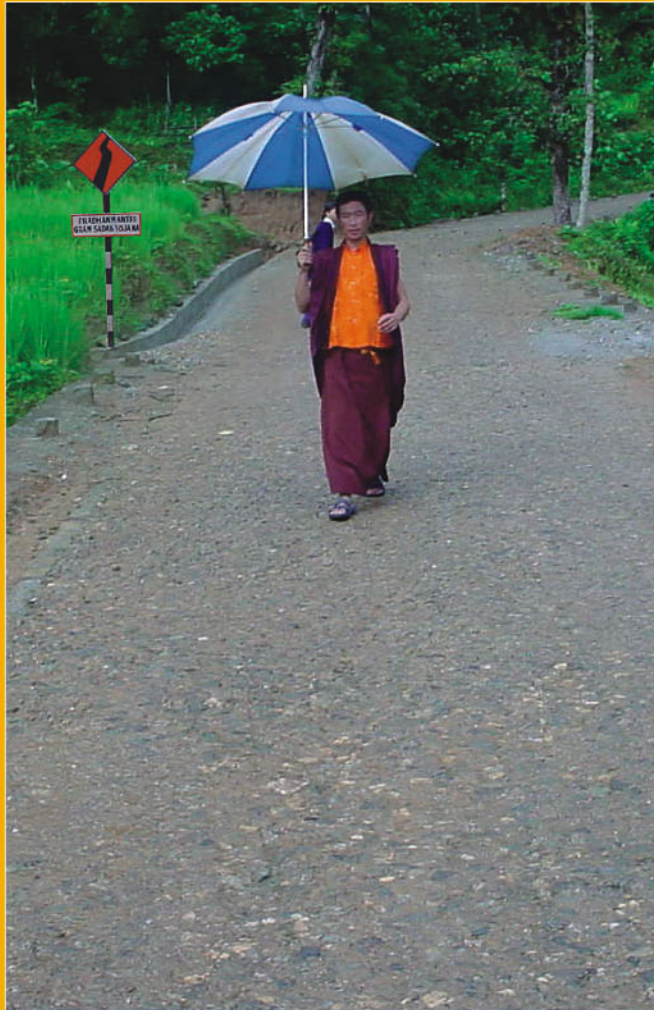


maintain records only, as it is necessary that the correctness of the tests is also checked at the appropriate time. As such, it has been prescribed that 50% tests should be conducted in the presence of a JE, 20% in presence AE and 5% in presence of an EE. To ensure the conformance of quality of material and workmanship, the Engineer is required to maintain Quality Control Register Part 2.

The inspection and supervision of work also falls under the first tier of quality mechanism. Under PMGSY, frequency of inspections for JE, AE, EE or SE and higher officers has not been prescribed because the responsibility of execution and quality control lies with the States and it was felt that the States would have their own mechanism for inspections and supervision of works.

### Need for Review

The feedback on the first tier of QM has revealed that in a few States, on one hand, the field laboratories could not be properly established and QC tests could not be conducted



because of their unrealistic frequency prescription, on the other hand, the inspection of works could not be carried out by the supervisory level officers also. In fact, because of weak supervision by the senior officers of the Executive Agency the first tier of QM is not working in the manner it is desired. Such States have not been able to internalize the quality consciousness in works and the issues which should be addressed through the First Tier, such as, compaction in E/W and GSB, quantity of screenings in WBM, watering, drainage etc could not be addressed adequately.

The process of review of this quality mechanism is continuous since its inception, with a view to continuously improve the system. During the various interactions in the review meetings and workshops, the State Officials, PIUs, NQMs, STAs and PTAs have widely discussed the quality mechanism. The performance audit also brought out some very pertinent issues. Based on the experience gained and the feedback, it is felt that the present quality mechanism needs to be reviewed. The first attempt in the process may be started with the review of first tier, with a view to strengthen the mechanism of enforcement of standards, by the following inputs:

- Rationalization of frequency of mandatory quality control tests
- Strengthening of process of supervision by senior engineers of the State
- Building clear accountability of executing machinery

#### **Mandatory Tests and Related Issues**

Specifications provide for a set of mandatory quality control tests for the material as well as the workmanship of every item of road work. The tests are to be conducted with the help of prescribed testing equipments and prescribed procedure, generally standardized by Bureau of Indian Standards. In a typical case of an average road constructed on an embankment of 90 cm height, about 200 tests are required for each kilometer. One can easily imagine the amount of efforts required for this kind of testing. There is no doubt that the prescription of tests in such a large number has its own importance, but there seems to be a need to look into this aspect and assess whether this kind of elaborate testing is practically possible for rural roads (huge length to be constructed) and whether this level of precision is required. Unrealistic testing frequency, at the most, maybe perceived as “Best is the Enemy of Good” and a question arises as to how much is being achieved by prescribing something which is not practically achievable.



Construction of rural roads is not a very simple task. One major constraint in managing the quality of construction is widely dispersed locations of smaller magnitude works. The difficulty of the construction agency in managing the quality does not end with providing adequate resources in terms of man and machinery but non-availability of the other infrastructure facilities at far-flung locations creates a lot of hurdles. The difficulty of construction or the supervision agency in adhering to the frequency of tests needs to be realized. The other constraint is capacity of contractors, whatever may be prescribed but it remains a field reality that majority of the road works are actually executed by such contractors who have limited capacity and competence. In the present time and perhaps in future also, it cannot be expected that the major contractors with very large capacity and expertise would come forward to build rural roads in large numbers. It is therefore urgently required that the prescription of mandatory tests for rural roads should be reviewed.

### Supervision and Accountability

It has clearly emerged that the prescription of mandatory testing and enforcement arrangement in the bidding process is not helping beyond a limit. The mechanism of supervision by senior officers is not effective in many States. The engineering officers are overloaded with non-professional activities and hardly get enough time for attending to the actual technical work. It has come to light that the records and papers indicate the quality and quantity of work to be as per the prescribed specifications but the actual performance of the work indicates a different reality. It also seems that there are some gaps in the system of fixation of responsibility

for ensuring clear accountability, therefore; there is a need to review the conventional mechanism of supervision of works and associated process of ensuring accountability.

Thus, there is a clear need to look into the institutional capacity of the State executing machinery. The supervision system deserves to be strengthened to ensure adequate “process control” leading to “product-end result control”. In addition, clear accountability is required to be built at every stage of work. One time tested mechanism for effective accountability could be the concept of **Stage Passing**. This mechanism may be developed in consultation with the Chief Engineers, SEs and PIUs working under PMGSY. It may be noted

that in addition to the procedures of the State Government, the stage passing exercise may require substantial additional work at the PIU level.

If the first tier of quality mechanism works properly, the quality of work is generally good and independent monitoring prescribed in second and third tier would further help in reaching the goal of best quality. But no amount of independent monitoring is likely to yield the desired results unless the first tier is fully operationalised and clear accountability for quality is built.



## Cement Concrete Roads Vs Bituminous Roads - A Cost Analysis

### *Cement Manufacturers' Association*

#### **Background**

India's economic growth plan of over 6% per annum for the next 20 years will, to a great extent, depend on an efficient road infrastructure, not only National Highways but other roads too, including link roads for rural connectivity, which can provide fast movement of goods and people with safety and economical cost to the user. Government of India has drawn up Pradhan Mantri Gram Sarak Yojana (PMGSY) for implementation of rural connectivity. It is estimated that in the next 7 years, road works under PMGSY worth Rs. 1,20,000 crores are to be constructed/upgraded.

Since road pavements are an important part of these projects, costing about 50% of the investment, a careful evaluation of the alternatives is necessary to make the right choice on a rational basis, which may be comparatively more beneficial to the nation.

#### **Types of Pavement**

There are two basic types of pavements from which a selection can be made :-

**Flexible Pavement:** Consisting of various layers of granular materials and provided with a layer of bituminous materials (PC) on top.

**Rigid Pavement:** Consisting of a cement concrete pavement laid on a well prepared granular sub-base.

Flexible Pavements have been the preferred choice because of low initial cost as compared to the Rigid Pavements. In view of availability of cement in plenty within the country and scarcity and rising prices of bitumen (as crude oil prices in the International market are rising and bulk of crude oil (70%) has to be imported from other countries), it has become prudent to consider rigid pavement, a far better alternative to flexible pavement. The superiority of rigid pavements over flexible pavements is well recognized the world over and many developed countries have already constructed long stretches of concrete roads to meet the increasing passenger and freight traffic on high traffic corridors.

Initial cost of the concrete pavement on rural link roads is more by about 25% over the flexible pavement, but in life cycle costing concrete pavement has proved to be economical over flexible pavement.

The selection criteria of type of pavement, flexible or rigid, should be based not on the initial cost of construction but life

cycle cost, which includes the discounted maintenance and pavement strengthening costs that are incurred during the design life of the pavement.

#### **Initial Cost**

This is the cost of construction of the pavement which mainly depends upon the pavement thickness, governed by the strength of subgrade soil and traffic loading, cost of materials and cost of execution of the work. The above have a wide range of variability across the country and is difficult to generalise.

#### **Maintenance Cost**

The maintenance cost includes the maintenance of pavement during the design life of pavement to keep the pavement at the specified service level.

In case of rural roads, maintenance of these roads is to be done by the respective State Government from its available financial resources. Most of the states have poor past performance record to maintain such low volume roads built through other schemes, mainly because of having inadequate funds for maintenance of road infrastructure in the state.

#### **Life Cycle Cost Analysis**

The choice of the appropriate economically advantageous pavement type, flexible or rigid, is made by carrying out Life Cycle Cost (LCC) analysis which takes into account the initial investment cost and also the maintenance/rehabilitation cost





over the design life of the pavement structure. **Life cycle cost analysis can be defined as a procedure by which a pavement design alternative will be selected, which will provide a satisfactory level of service at the lowest cost over design life.** The economic analysis methods used most commonly for this purpose include present worth, annualized cost, and rate of return. The analysis is most sensitive to the factors of inflation, discount rate, and analysis period.

In the subsequent paragraphs, an attempt has been made to study the long-term economic viability of pavement types using Present-Worth method of analysis. Thus, as a case

study, comparative cost of one kilometer each of flexible pavement and rigid pavement representing a uniform section has been worked out at current market rate, with respective maintenance strategy for a road under PMGSY.

Accordingly, for this purpose, a typical pavement composition and its cost for a rural road has been adopted for the assessment.

#### Flexible Pavement Design and Cost of Construction per km :

The design of flexible pavements depends upon the CBR value of sub grade and number of commercial vehicles per day that will use the road during its design life, which is 10 years for Rural Roads. A typical pavement composition based upon SP:20-2001 and its cost for rural road with CBR value of 4 and traffic of 75 cvpd is given below :

GSB	250 mm (full width)	@Rs. 600	=	Rs. 300	per m <sup>2</sup>
WBM	225 mm	@Rs. 800	=	Rs. 180	per m <sup>2</sup>
PC	20 mm	L.S.	=	Rs. 90	per m <sup>2</sup>
including prime coat and tack coat					
<b>Total</b>				<b>=</b>	<b>Rs. 570 per m<sup>2</sup></b>

**The cost of the above 3.75 m wide payment will thus be about Rs.21 lakh per km.**

#### Maintenance Cost of Flexible Pavement

- It will be assumed that one layer of WBM will be laid on 10<sup>th</sup>, 20<sup>th</sup> years after construction of road with 75 mm WBM.
- Surface renewals are to be provided as per NRRDA guidelines once in 5 years of 20 mm PC.
- The cost of ordinary repairs for rural road with flexible pavement has been taken from NRRDA Norms @ Rs. 14000 per year (average)

#### Rigid Pavement Design and Cost of Construction per km. :

The design of rigid pavement depends upon the CBR value of sub grade, design axle load of commercial vehicles during the design life, which is generally 20 years or more for rural roads. A typical pavement composition for rural road is given below : (Refer : SP:62-2004) :

GSB	100 mm (full width)	@Rs. 600	=	Rs. 120	per m <sup>2</sup>
PQC (M <sub>35</sub> )	180 mm	@Rs. 3300	=	Rs. 600	per m <sup>2</sup>
<b>Total :</b>	<b>280 mm</b>		<b>=</b>	<b>Rs. 720</b>	<b>per m<sup>2</sup></b>

**The cost of above payment will thus be about Rs. 27 lakh per km.**





### Maintenance Cost of Rigid Pavement

The average yearly maintenance cost of rigid pavement will be about Rs. 10,000 per km for a single lane rural road to cover filling of sealing compound in the joints, repairs of concrete spalling etc.

### Life Cycle Cost Analysis

Period of analysis has been considered as 20 years, being the design life of concrete pavement in rural area. The discount rate of 10% has been taken. Inflation rate of 5% has been considered for future rise in prices of materials.

### Cost Estimate

1. Initial Cost of Flexible Pavement = Rs. 82 lakh per km
2. Initial Cost of Rigid Pavement = Rs. 27 lakh per km
3. Initial Cost of Rigid Pavement = Rs. 25.25 lakh per km.  
(using 30% fly ash for replacement of cement)
4. Annual Maintenance of flexible pavement = Rs. 0.14 lakh per km.
5. Renewal of wearing course of flexible pavement every 5 years =  $90 \times 3.75 \times 1000 =$   
Rs. 3,37,500  
-5<sup>th</sup>, 15<sup>th</sup> year after completion Say Rs. 3.50 lakh
6. Strengthening with WBM every 10<sup>th</sup> year-10<sup>th</sup>, 20<sup>th</sup> year  
WBM 100 mm =  $0.10 \times 3.75 \times 1000 \times 800 =$ Rs. 3,00,000  
PC 20mm =  $90 \times 3.75 \times 1000 =$ Rs. 3,37,500  
Total Cost= Rs. 6,37,500 Say Rs. 6.50 lakh

7. Average maintenance cost of rigid pavement = Rs.10,000 per year

### Economic Analysis

The details of economic analysis based on net present worth method i.e. net present value of total of construction, maintenance cost, over the analysis period of 20 years are provided in Annexure 1 for flexible and rigid pavement. The summary of Initial and Life Cycle Costs are given below :

### Summary of Initial and Life Cycle Cost

(Rs. Lakh)			
S.No.	Pavement Type	Initial Cost	Life Cycle Construction/Maintenance Cost
1.	Flexible/Bituminous	21	33.60
2.	Rigid/Concrete	27	28.30
3.	Rigid/Concrete with 30% fly ash replacement	25.25	26.50

### Conclusion :

- The initial cost of a concrete pavement is Rs. 6 lakh per km (28%) higher over the initial cost of a flexible pavement. However if fly ash (30%) is used to replace cement in concrete, the extra cost of concrete pavement is Rs. 4.25 lakh per km (20%).
- The life cycle cost of a concrete pavement for construction/maintenance costs is however Rs. 5.3 lakh per km (19%) less compared to flexible pavement. In case of fly ash mixed concrete, the concrete pavement cost is Rs. 7.1 lakh per km. (27%) less compared to flexible pavement.
- From the above it can be concluded that although the initial cost of concrete pavement is higher as compared to the bituminous pavement but life cycle cost of concrete pavement is about 20-25% lower than bituminous pavement.
- Besides life cycle cost consideration, several locations should be preferred for rigid pavement from climatic/environmental considerations such as locations in heavy rainfall/waterlogged areas, road stretch passing through village portion, having cement and fly ash in close proximity or sub-grade soil having low CBR values.
- State Governments may not be able to provide necessary funds for maintenance of rural bituminous roads due to inadequate funds available for maintenance of roads due to paucity of funds, which will result in loss of assets to



the nation. Concrete roads once constructed properly, will prove an asset to the nation.

- Looking to the above advantages, MoRD/NRRDA has decided to implement a Technology Demonstration Project with concrete pavement under PMGSY, where extra cost of concrete pavement will be shared by MoRD and State Government on equal basis. Such roads can be proposed by State Governments upto 10% of remaining PMGSY works.

It is quite important to note that the extra share to be borne by the State Governments now, during construction (Rs. 3 lakh/km), in any case has to be spent after 5 years for providing 20 mm PC surfacing to protect the road from



further damage to the pavement. Thereafter cement concrete road will be a bonus (free from maintenance) to the State Govt.

Annexure - I

#### LIFE CYCLE COST ANALYSIS (CONCRETE ROADS IN RURAL AREAS UNDER PMGSY)

##### DATA ASSUMPTION

Analysis Period	=	20 Years
Discount Rate	=	10%
Inflation Rate	=	5% Per Year

##### Cost (Rs. Lakh) Per Km.

	Flexible (BT)	Rigid (Concrete)
Construction Cost	21.00	27.00
Routine Maintenance/Year	0.14 (average)	0.10 (average)
Renewal (5 Years)	3.50	-
Strengthening (10 Years)	6.50	-

Year	Flexible Pavement			Rigid Pavement		
	Constn. Cost	Maintenance Cost	NPV(1/1.10) <sup>n</sup>	Constn. Cost	Maintenance Cost	NPV(1/1.10) <sup>n</sup>
0	21.00	-	21.00	27.00	-	27.00
1	-	0.15	0.14	-	0.11	0.10
2	-	0.15	0.12	-	0.11	0.09
3	-	0.16	0.12	-	0.12	0.09
4	-	0.17	0.12	-	0.12	0.08
5	-	<b>4.47</b>	<b>2.78</b>	-	<b>0.13</b>	<b>0.08</b>
6	-	0.19	0.11	-	0.13	0.07
7	-	0.20	0.10	-	0.14	0.07
8	-	0.21	0.10	-	0.15	0.07
9	-	0.22	0.09	-	<b>0.16</b>	<b>0.07</b>
10	-	<b>10.59</b>	<b>4.08</b>	-	0.16	0.06
11	-	0.24	0.08	-	0.17	0.06
12	-	0.25	0.08	-	0.18	0.06
13	-	0.27	0.08	-	0.19	0.06
14	-	0.28	0.07	-	0.20	0.05
15	-	<b>7.28</b>	<b>1.74</b>	-	<b>0.21</b>	<b>0.05</b>
16	-	0.31	0.07	-	0.22	0.05
17	-	0.32	0.06	-	0.23	0.05
18	-	0.34	0.06	-	0.24	0.04
19	-	0.36	0.06	-	0.25	0.04
20	-	<b>17.25</b>	<b>2.56</b>	-	<b>0.27</b>	<b>0.04</b>
<b>Total NPV Cost</b>			<b>33.60</b>			<b>28.30</b>

- Life Cycle cost of flexible pavement will be about 19% higher than rigid pavement after 20 years.
- Since the life of concrete pavement will be more than 30 years, hence, after 20 years life concrete pavement will further serve for at least next 10 years with nominal maintenance.
- After 10<sup>th</sup> year the NPV of flexible pavement will exceed for concrete pavement.
- Using fly ash in concrete pavement, initial and life cycle cost of concrete pavement will further reduce.



## Implementation of OMMAS in Districts

**Anubha Goyal**, Incharge NIC-MoRD Project Cell

OMMAS (Online Management, Monitoring and Accounting System) for PMGSY is a web based online software, which helps in monitoring and managing the project.

### The main features of OMMAS are:

- Anytime and Anywhere availability of data: It is being successfully fulfilled since the website is available 24 hours, 7 days a week and the information is on the web and can be accessed from anywhere.
- Data Entry is at the origin (i.e. PIU level), which immensely helps to avoid duplicity of effort and data, and **no manipulation** is possible at higher level.
- Work Flow Enabled: Every manual process in the programme has a corresponding module in the software, so the workflow and data flow are both maintained side by side. This is depicted in Figure1.
- Effective Decision Support Tool: The software generates real time reports and thus helps in decision-making at the State and Central level.
- Quick and Easy Compilation of Data is possible at District, State and National Level.
- Transparency of Operations: The website contains reports on all aspects of a road starting from the proposal to completion, giving both physical and financial progress, available to citizens all over the world in the public domain.
- Offline Module for area with poor internet connectivity: In districts where connectivity is a major hurdle in data entry, the offline module has been provided so that the data can be entered in Excel sheets offline and uploaded into the software from any kiosk or NIC district units where internet connectivity is available.
- Role based and authenticated data entry: For every level, Ministry, State and District, there are authorized users who can make an entry in different modules of the software. Every authorized user is given a user id and password without which he cannot access the data entry screens. Only those particular fields, in the forms that a user is allowed to enter data in, are available for data entry. The link **"For data entry only"** on the home page of

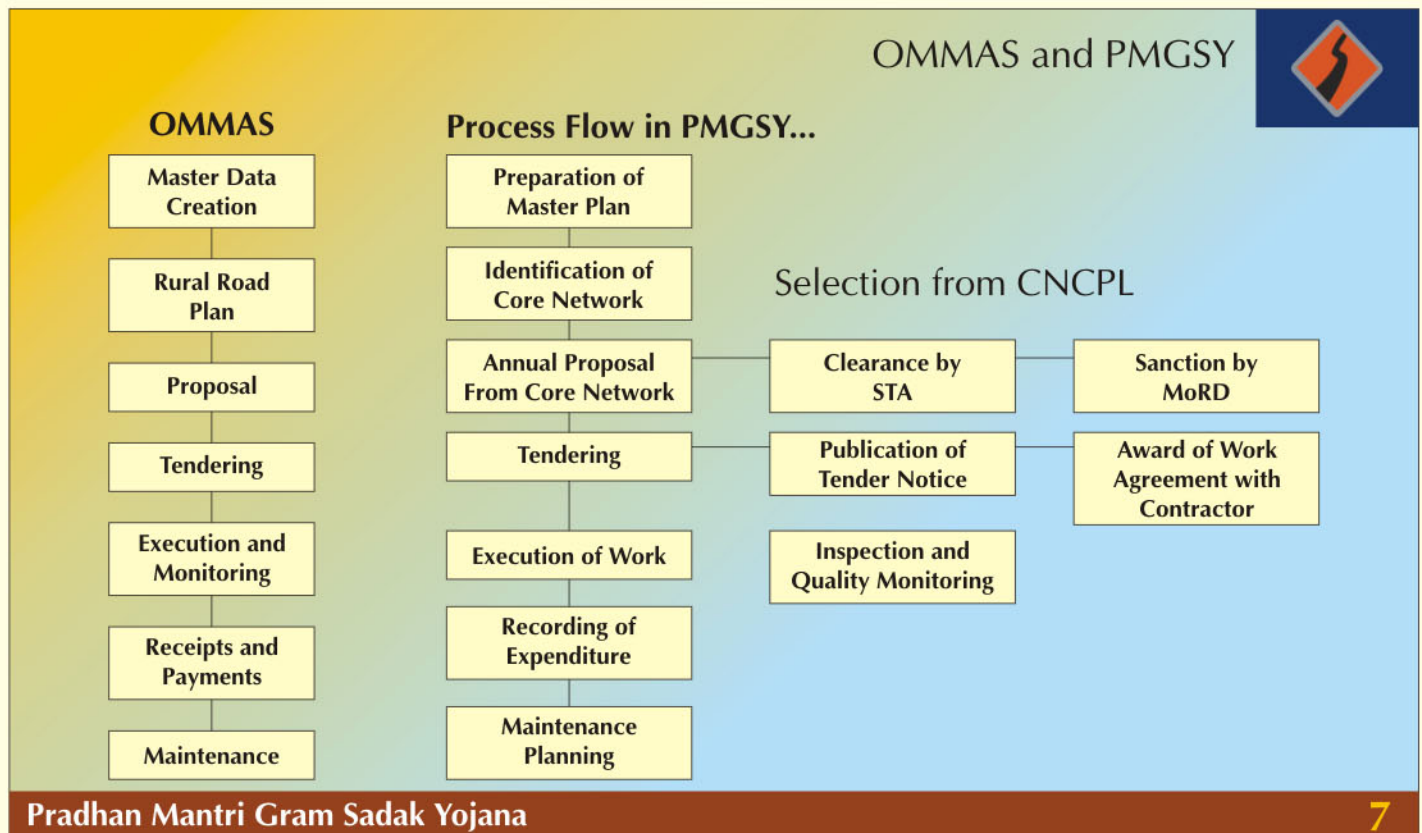


Figure-1





the website <http://pmgsyonline.nic.in> OR <http://pmgsyonline.gov.in> OR <http://omms.nic.in> or <http://ruralroadsonline.nic.in> is **for authorized users** only for data entry and for alerts, using their user-id and password. This is the only link that is not available in the public domain.

#### Infrastructure in Terms of Hardware and Software

Every DPIU has been given two client machines, a UPS and a printer for data compilation and data entry. Most DPIUs are presently using dial-up internet connections for data entry

but they have been asked to avail the facility of broadband connectivity, if available, in their districts.

#### Infrastructure in Terms of Training

Training on every version of the software has been given to Master Trainers from NICSI and State IT Nodal Officers designated by the State Nodal Agency. These personnel have then trained the district officials at State Headquarters. There are a series of training programmes conducted at State Headquarters wherein all DPIU personnel are trained on any additional module developed in the software. Accounting Module training has been done for 2-3

accounts personnel of every State in the first round. After that, as and when a State has decided to implement the Accounting Module, a special training has been conducted at State Headquarters of that State.

#### OMMAS Data Entry

As is evident from Table 1, all the data entry in the software is done at the district level, except for technical clearance by STA, sanction of proposals by NRRDA/MoRD, monitoring of 2<sup>nd</sup> tier by SRRDA, monitoring of 3<sup>rd</sup> tier by NRRDA. The frequency of data entry is also mentioned in Table 1:

Module	Data entry by	Frequency
Block, Village, Habitation, Road Master giving Core Network	DPIU	One time
Proposal	DPIU	As and when proposed
Checking and Clearance of proposal	STA	As and when scrutinized
Sanction by Empowered Committee	NRRDA	As and when sanctioned
Tendering	DPIU	As and when tendered
Award of work	DPIU	As and when awarded
Execution (Physical Progress)	DPIU	Monthly
Execution (Receipt and Payment)	DPIU	Monthly
2 <sup>nd</sup> level quality monitoring	SRRDA	After inspection
3 <sup>rd</sup> level quality monitoring	NRRDA	After inspection
Completion of work	DPIU	On completion
Maintenance	DPIU	

Table 1



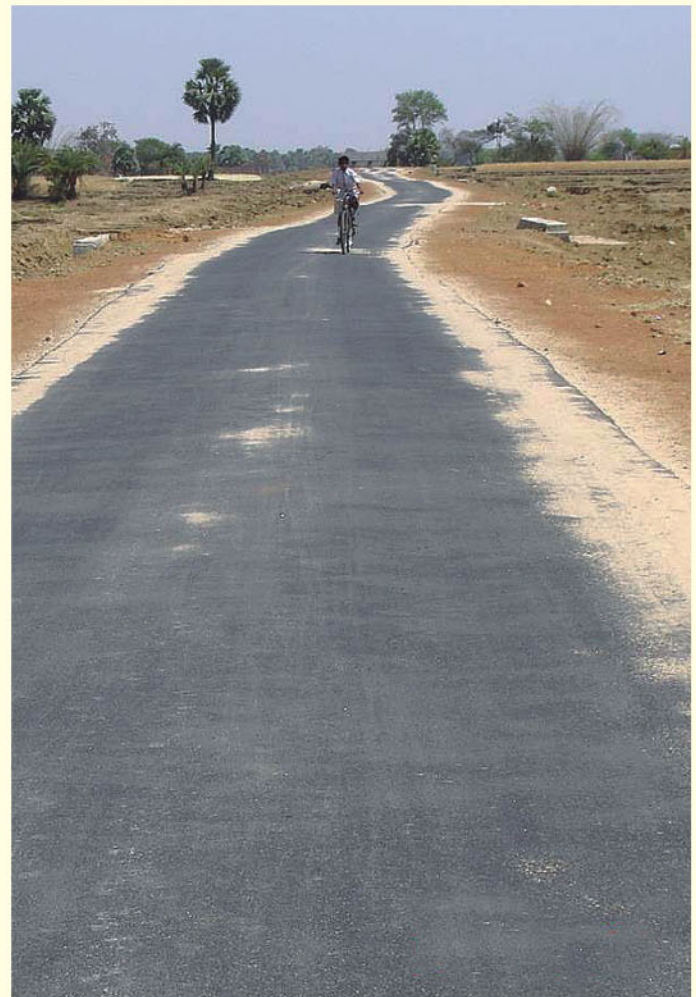
### OMMAS Monitoring

Monitoring in OMMAS is done with the help of the National, State, District, Quality Monitoring, Tendering, Core Network, Analysis and Data Entry Reports. The reports are drillable down i.e. National to State to District to Block to Package to Road. The execution of the programme is decentralized but monitoring is centralized. Up-to-date data entry is necessary and provision of informing the data gaps in the data entry have been made. This is done through the "Online Data Entry Status" which indicates the data entry remaining in Master Data, Roadwork details, Tendering, Physical and Financial Progress, DRRP and Core Network.

### Successful Implementation of OMMAS

Main reasons for the successful implementation of OMMAS:

- The biggest advantage in implementation of this scheme is that because the personnel entering data, at the district level and state level, have an **engineering background** it is not difficult to train them and get the software implemented.
- **Ministry is monitoring** the implementation of the programme and has put a condition on the sanction of funds. Every sanction is subject to complete implementation status of previous sanctions.
- The lowest level of implementation of the software is the district and **internet connectivity is available** at most of the districts.





## Numeration Rules

**Gurdip S. Khinda**, Former SE, Ministry of Road Transport & Highways, NQM (PMGSY), NRRDA and Technical Advisor, IRC

The use of SI Units became legal in the country during 1976, after the enactment of The Standards of Weights and Measures Act, 1976. The Act extends to the whole of India. *As per this Act, only standard weight, measure of numeral shall be used and except that, no weight, measure or numeral shall be used.*

The Standards of Weights and Measures (Numeration) Rules, 1987 enacted under the above Act became effective from 02.12.1987 and a period of ten years was fixed for its full implementation. *This period has already expired on*



02.12.1997. These rules, though shortest of all the rules made under the Standards of Weights and Measures Act, 1976, have far reaching consequences. *Representing any number in digits in the international form of Indian numerals, means the harmonization not only at the national level but also at the international level.*

With a view to enhance awareness among Engineers and their staff about the Numeration Rules, an attempt has been made to give the current Indian legal and best Global practices in this paper.

### Main Provisions in the Numeration Rules

The main provisions of the above mentioned Numeration Rules are:

- i Every numeration shall be represented in accordance with the decimal system;
- ii Every number shall be represented on base ten;

- iii In representing any number in digits, the international form of Indian numerals, namely 0,1,2,3,4,5,6,7,8,9 or combination thereof shall be used;

**Table 1: Manner in which numbers exceeding three digits shall be written in words**

Sl.	Number No.	Numeration in English	Hindi Numeration in Roman script
1.	$10^3$	Thousand	Hazar
2.	$10^4$	Ten Thousand	Das Hazar
3.	$10^5$	Hundred Thousand	Lakh
4.	$10^6$	Million	Das Lakh
5.	$10^7$	Ten Million	Crore
6.	$10^8$	Hundred Million	Das Crore
7.	$10^9$	Billion	Arab
8.	$10^{10}$	Ten Billion	Das Arab
9.	$10^{11}$	Hundred Billion	Kharab
10.	$10^{12}$	Trillion	Das Kharab

- iv Numbers expressed in digits exceeding three shall be written in words in the manner specified in the Table 1.

NOTE: It may be noted from the above Table that the words lakh and crore are not pluralized while writing Das Lakh or Das Crore. Similarly, the words million and billion are also not pluralized.

- v Manner in which Numbers shall be written

- (a) In writing according to English terminology, any number in digits exceeding three, the decimal point shall be taken as the starting point and the digits, whether to the left or to the right of the decimal point, shall be divided into groups of three, starting from the decimal point and, neither dots nor commas shall be inserted in the spaces intervening between such groups of digits.

**Example: 123 345.732 456**

- (b) In writing according to Indian Terminology, any number in digits exceeding three, the decimal point shall be taken as the starting point and the first three digits, whether to the left or to the right of the decimal point, shall be grouped together and the subsequent digits shall be divided into groups of two and neither dots nor commas shall be inserted in the spaces intervening between such groups of digits.

**Example: 23 14 345.732 23 50**



### Application of the Numeration Rules

At present, there is no uniformity in writing amounts in the Indian currency, PIN Codes and Telephone Numbers etc. Using the logic in the Numeration Rules, amount in Indian currency, City PIN codes, Telephone, Mobile Numbers could be written as under for easy comprehension:

#### Amount Indian Currency

Estimated cost of construction of PMGSY road = Rs. 15.85 lakh/km

Estimated cost of construction of PMGSY road Package = Rs. 14.55 crore

Cost of RCC per cum: **Rs. 3 564** (not Rs. 3564/-) or **Rs. 3564.<sup>00</sup>**

#### City Pin Code

Pin Code for NRRDA Office **New Delhi – 110 066**  
 Pin Code for MoRD Office **New Delhi – 110 001**  
 Pin Code for IRC Office **New Delhi – 110 022.**

### Telephone / FAX Number

Telephone Number of NRRDA: (City code) Exchange Code – Telephone Number  
**(11) 26716930 33 / 36**

Telephone Number of Chief Quality Coordinator **(11)4100 0472**

FAX Number of NRRDA: **+91 (11) 4100 0475**

Mobile Number: **98101 12345**

### Conclusion

It is desirable that all Engineers (including their staff) in the country, especially Engineers connected with PMGSY roads, make use of the aforesaid information about the **Numeration Rules** in their official / professional work to bring uniformity in their work as well as in their publications.

### References:

1. The Standards of Weights and Measures Act, 1976
2. The Standards of Weights and Measures (Numeration) Rules, 1987

## FEEDBACK





## Meeting of NRRDA General Body

The 5<sup>th</sup> Meeting of the General Body of the National Rural Roads Development Agency (NRRDA) was held on 20<sup>th</sup> April, 2006 at 'Unnatti' in Krishi Bhavan, New Delhi. The meeting was Chaired by Dr. Raghuvansh Prasad Singh, Union Minister for Rural Development, who is also the President of NRRDA. The General Body approved the Action Plan and Budget Estimates for 2006-07.

While addressing the General Body, the Minister mentioned that the absorption capacity of the States need to be raised to meet the goals of Bharat Nirman and stringent measures are necessary to ensure that in the process of scaling up the programme, quality does not deteriorate. He reiterated that timely maintenance of the roads constructed under the programme should be ensured by the States. He also underscored the need for outcome monitoring and technical audit. He advised the agency to provide necessary guidance and support to the States for effective implementation of the programme.

## Regional Review Meetings



A round of Regional Review Meetings to review the implementation of PMGSY is being organized during April-June, 2006.

The first meeting was organized on 18<sup>th</sup> & 19<sup>th</sup> April at Chandigarh, where the implementation of the programme was reviewed for the States of Haryana, Himachal Pradesh, Jammu and Kashmir, Madhya Pradesh, Punjab, Rajasthan, Uttar Pradesh and Uttaranchal.



The second meeting was organized on 2nd and 3<sup>rd</sup> May, 2006 at Hyderabad where the implementation of the programme was reviewed for the States of Andhra Pradesh, Goa, Gujarat, Kerala, Karnataka, Maharashtra and Tamil Nadu. The meeting was addressed by Dr. Renuka Vishwanathan, Secretary, Ministry of Rural Development, Government of India.



In addition to the officers of NRRDA and Ministry of Rural Development, the meeting was attended by the State Secretaries, Chief Executive Officers of State Rural Road Development Agencies, Chief Engineers, State Quality Coordinators and IT Nodal Officers of the participating States.

Two more meetings are scheduled for the month of June, 2006. The review of Eastern States of Chhattisgarh, Jharkhand, Orissa and West Bengal will be carried out in a meeting at Bhubneshwar on 22nd and 23<sup>rd</sup> June, 2006. The review of North-Eastern States of Assam, Arunachal Pradesh, Manipur, Mizoram, Meghalaya, Nagaland, Sikkim and Tripura will be carried out in a meeting at Guwahati on 29<sup>th</sup> and 30<sup>th</sup> June, 2006. These meetings are likely to be addressed by the Secretary, Rural Development.



# Details of Citizens' Information Board un

