“Performance Evaluation Of Pradhan Mantri Gram Sadak Yojana In Marathwada Region.”

3

Importance of the PMGSY for Rural Development

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• References.
• **Introduction:**

Roads can reach the doorsteps. There are areas, which can be reached through road only. Vast hinterlands of the country can be linked only through roads. We have more than 6 lakh inhabited villages with more than 10 lakh habitations. We can reach them only through roads. We have only 7,000 railway stations.¹ From railway stations to cities and within city to one’s shop and residence, one can reach only through roads. Short distances to connect railway system have to be covered through roads only. The railways have certain limitations in terms of flexibility.

When major transportation was carried through carts and camels, we did not need modern surfaced roads. We might have had one crore bullock carts engaging two crore heads of cattle and one crore persons engaged in bullock cart transportation. Only cities had *pucca* roads for use horse carts. Now we are having motorized vehicles, which need *pucca* roads. Rural urban link has also to be served through road network so that farmers could take their produce to nearby *mandis* or perishable vegetables and milk and milk
products could be collected from rural areas for consumption in towns and cities.

In Europe, first, a canal system was developed for cheap transport of goods. Later on, they developed steam engine and with that railway became prominent.\(^2\) Once petroleum was discovered and internal combustion engine was developed, road system came to supplement the rail system extensively as it is quicker, more convenient and more flexible in comparison to the railways. Modern material for surfacing roads also became available because of development of petroleum products. Modern roads in India came to draw particular attention of the Government of India after creation of the Central Road Fund in 1929, which is now partly spent on maintenance and construction of the national highways and partly on construction of rural roads, inter state roads or roads of economic importance.

- **Historical Review of Road Networks in India:**

  Indian road network is one of the largest in the world. In 1950-51, we had a road network of about four lakh km. of road – 1.6 lakh
km. surfaced and 2.4 lakh km. un-surfaced. While surfaced roads are all weather ones, un-surfaced ones become unserviceable during monsoon. Presently we are having 25 lakh KM. of total road length of which 14 lakh KM is surfaced. For the purpose of construction, repair and maintenance the roads have been categorized as the National highways, State highways and other roads. While national highway are the responsibility of the Central Government. All other roads, including State highways, are the responsibility of the Government of the respective states in whose jurisdiction they fall. By 1950-51, national highways measured some 20,000 KM., which increased to 58,000 KM. in 2001. Many more roads had been taken over by the Government of India under National Highway Act 1956; 5,727 KM were added only in 2000-01. State highways increased from around 57,000 KM. in 1971-71 to 1.4 lakh KM by 2001. States also widened the scope of their highways. Most of these roads are surfaced. They have also been widened. But highways, national and state account for less than two lakh KM and are now almost surfaced. To see the progress overtime see the Table No. 3.01
Table No. 3.01:
Progress of Road Networks in India.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>National Highways</td>
<td>9,800</td>
<td>21000</td>
<td>23300</td>
<td>31500</td>
<td>33400</td>
<td>57700</td>
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<tr>
<td>Surfaced</td>
<td>157019</td>
<td>263015</td>
<td>397000</td>
<td>692171</td>
<td>1091043</td>
<td>1400000</td>
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<tr>
<td>All Roads</td>
<td>399942</td>
<td>524478</td>
<td>917880</td>
<td>1491301</td>
<td>2331086</td>
<td>2500000</td>
</tr>
<tr>
<td>All Vehicles</td>
<td>306000</td>
<td>665000</td>
<td>1865000</td>
<td>5391000</td>
<td>21374000</td>
<td>40000000</td>
</tr>
<tr>
<td>Goods Vehicles</td>
<td>82000</td>
<td>168000</td>
<td>343000</td>
<td>554000</td>
<td>1356000</td>
<td>3000000</td>
</tr>
<tr>
<td>Buses</td>
<td>34000</td>
<td>57000</td>
<td>94000</td>
<td>162000</td>
<td>331000</td>
<td>600000</td>
</tr>
<tr>
<td>% Villages with 1000 population connected with Roads</td>
<td></td>
<td></td>
<td>29%</td>
<td>46%</td>
<td>75%</td>
<td></td>
</tr>
</tbody>
</table>


While the length of our road network has risen from 4 lakh KM to 25 lakh KM, the vehicle population has grown from 3 lakh to 4 crore, freight traffic from 600 crore tonne KM to 45,000 crore tonne KM, and passenger traffic from 2,300 crore passenger KM to 1.5 crore passenger KM. But, we also should appreciate that, besides length, quality of roads in terms of strength and width should have improved over time. Moreover, out national highways are catering to 40-50 per cent traffic.4
• **Importance of Rural Roads:**

Rural roads are part of total road network system and basically consist of various categories such as National Highways, State Highways, Major District Roads, Other District Roads and Village Roads. Rural roads include Other District Roads and Village Roads as tertiary system for providing accessibility in rural areas. Rural roads, therefore, become links of a network, which facilitate the movements of persons and goods in an area. There are several other interconnecting routes also exists in rural areas. A road network, therefore, needs to be developed in such a way that the travel needs of the people in an area are met to the maximum extent in a collective way at the lowest cost of development. In rural areas major part of travel needs comprises of travel to market place, education and health centers. Planning of road system should always focus on spatial aspect of planning and should be integrated with other non-spatial socio-economic activities. Roads have to be planned and programmed in such away that all villages are connected in an optimal way to achieve efficient flow of traffic and accessibility. Development of roads is essential for bringing agricultural products to *mundies* for their marketing. Crores of rural people have to go to cities and
mundies daily for seeking employment and purchasing essential commodities. Thus rural roads have special significance in Indian economy.

The total road network of an area needs proper integration with necessary interfacing befitting the functionality assigned to a type of road otherwise the continuity of transport flows may get affected. Currently lot of emphasis is given for the roads providing mobility through programmes like NHDP for selected national highways, some state road programme and rural access through PMGSY. However, the intermediate category of roads belongs to State Highways and Major District Roads are not receiving the emphasis they deserve. There should a balanced development approach for all type of road in order to achieve continuity in movement from rural habitations to market centers at local, regional and national level. The state agencies responsible for development of these roads should identify the gaps in the existing systems of roads and generally adopt the master plan, in order to achieve the integration. There is need for network structural analysis with assigned traffic flows for the development of regional level roads comprising of highways and rural roads.
Rural roads have been constructed under various rural road development programmes, which are mainly conceived for employment generation and poverty alleviation. In such programmes serious efforts were not made to build sustainable all-weather roads. Roads were never considered to be engineering structures and these not designed to the required specifications. The roads built under these programmes, without back-up system or facility to sustain them with engineering inputs for repair and maintenance, have disappeared in no time. Many of the technical aspects of road making i.e. adequate compaction of sub-grade, roadside drainage, required cross drainage etc. were seldom given due importance in rural road construction.

In order to fulfil the objectives of PMGSY for provision of all-weather rural roads, the Indian Road Congress brought out the ‘Rural Roads Manual’. The manual covers all aspects related to rural roads including planning and alignment; geometric design standards; climate and environment; road materials and pavement design; road drainage, culverts and small bridges on rural roads; construction specifications and quality control aspects; guidelines for using waste
materials such as fly ash, etc., maintenance of rural roads and sources of finance for rural road development. Currently the manual is being followed for design of rural roads under PMGSY. To achieve more economy in designing the rural roads the Indian Roads congress is revising the manual based on the following criteria;

- Rural Roads are low volume facilities basically serving the access needs. The design speed and level of service expected are low. The design standards should be in harmony with such expectations.

- Geometric standards, particularly gradients, are difficult to change later, and hence should be selected carefully with the future requirements in view.

- The initial cost is an important consideration. Many roads particularly through routes will, in due course, carry fairly substantial traffic but it is preferable to optimize costs by stage construction in tune with traffic growth.

- A design period of 10 years is considered adequate, with rehabilitation being planned based on road condition.

- Durable and permanent assets need to be aimed at through adequate provision for drainage and protection works.
• The maintenance of assets must receive careful attention as a policy and should not be capitalized into richer than required standards at the design stage.

• **Impacts Of Rural Roads:**

  Impacts of rural roads are summarized as given below:

  • *Improvement in transportation services:* which leads to improved access to market centers for the rural producers, better availability of form inputs at reduced prices;

  • *Diversification of agricultural:* improved market access promotes shift in favour of cash crops and commercialization of agricultural activities.

  • *Diversification of livelihood opportunities:* better connectivity enhances employment opportunities in the non-agricultural sectors.

  • *Improved services:* improved road connectivity, inter-alia, enhances access to education, health and financial services.

  • *Increase in the outreach of the State:* Improved rural roads facilitate better availability of public services and functionaries in rural areas.
• **Sustainability of Rural Roads:**

Sustainable rural road development denotes economic use of the resource base which maintains its capacity and renewable productivity on a perpetual basis. It is a way of ensuring continued productivity of the asset, while maintaining those characters of environment necessary to human welfare in long run. Therefore, the rural roads asset created using the valuable environment resources such as precious soil, stone and other products, it has to be maintained to deliver the desired level of service. The institutional set up and the maintenance management aspects are to be synchronized with the environment aspects to sustain the assets created in various programmes.

• **Problems of Rural Roads:**

There were number of KM of missing road links, and thousands of culverts and bridges, were required to be constructed to have an integrated and continuous network. There was an increase in the missing road links owing to the addition of new roads to the national highways system in later years. This was stupendous task and though intensive efforts have been made during the planning period to
provide missing road links and construct new roads, substantial task remains to be done. A number of areas, particularly interior areas and hilly tracts remain to be linked up with roads. A more serious problem is that hilly tracts remain to be linked up with roads. A more serious problem is that large tracts of rural roads are *kutcha* roads which cannot be used for the plying of heavy vehicles and become unusable in rainy season. A number of roads are also poorly maintained. This is due to constraints of financial resources, organizational inadequacies, procedural delays, shortage of essential materials. Another problem is that most of State Road Transport Corporation is running in heavy losses. The main factor responsible for this has been the rising cost of operations on account of increasing prices of inputs used in road transport industry, without matching increase in fares. Inefficiency in operations is also an important contributory factor.

- **Rural Road Development:**

  Majority of the village roads are made of earth, called *kutcha* in the local language. The importance of roads in connecting the vast rural areas of India to form the national market and economy cannot
be overstated. Connectivity provided by roads is perhaps the single most important determinant of well being and the quality of life of people living in an urban area. The efficiency of the innumerable government programmes aimed at rural development, employment generation, and local industrialization is, to large extent, determined by the connectivity provided by roads. There is a considerable body of evidence that demonstrates the links between rural road investment, decline in poverty, and improvement in the quality of life. Road investment contributed directly to the growth of agricultural output, increased use of fertilizer and commercial bank expansion. Improvements in rural roads are positively correlated with decline in poverty. The potential value in improving of rural connectivity especially in the agricultural states is revealed by the large differences between mandi and farm gate prices. The construction of rural roads will deliver several benefits as-

- Freight charges will come down- with less roads to cover and non-congested traffic;
- Traveling will be pleasant- arduous hours in the roads due to escort system will reduce;
• Generation of employment opportunities - construction and maintenance of the road;
• Ensure better living standards in the rural areas - easy access to markets and better prices for agricultural produce;
• Attract Investment from other states and countries;
• Help in controlling the insurgent activities - government can be more vigilant;
• Boost the existing investment opportunities in rural industries.

• Central Government Initiatives for Rural Roads Development:

The development of rural roads is the responsibility of the State Government in India. Because of this, the rural roads received very little attention from the Central Government until 1967, when a special committee, under the chairmanship of Shri H.P. Sinha was appointed. The committee studied the rural roads and the connectivity pattern and recommended certain criteria for developing and for allocation of budget for rural roads. Since Fifth Five Year Plan, funds are allocated under various rural development programme such as Minimum Needs Programme (MNP), National
Rural Employment Programme (NREP), Rural Landless Employment Guarantee Programme (RLEGP), Jawahar Rozgar Yojana (JRY), etc. for the development of rural roads. During the Fifth Five Year Plan period (1974-1979) rural roads were included as a part of Minimum Needs Programme (MNP) of the Central Government and received importance for development. The programme envisaged connectivity of all villages with population of 1500 and above, as per 1971 census, with an all-weather road by the end of the Fifth Five Year Plan. It also proposed a cluster approach for connectivity in respect of hilly, coastal, tribal and desert areas, where the villages are smaller in population size.

In the year 1978 a Working Group on Rural Roads was set up by the Planning Commission of India to formulate connectivity criteria and make projections of road length and estimate requirement of funds for development of rural roads. The Committee made an assessment of existing rural road connectivity and estimated that an amount around Rs.11,000 crores would be required to connect all villages with all-weather road. Some of the recommendations of the Working Group were taken into consideration while formulating
budget for road development in the Sixth Five Year Plan and about 30 per cent of the total road outlay was allocated for rural road sector. Similarly, the plan outlay under the Seventh Five Year Plan was Rs.1729.40 crore for providing rural connectivity.13

The criteria for connectivity under MNP were periodically revised. During the Eighth Five Year Plan the criteria for linkage of villages to a road were modified. Priorities were accorded to link all villages with a population of 1000 and above on the basis of 1981 census and special efforts to accelerate village connectivity in respect of backward regions and tribal areas. The connectivity criteria under MNP were once again revised for the Ninth Five Year Plan. The revised norms for connectivity of villages adopted the 1991 population census as the base and the criteria were as for:14

- **Plain areas:**
  - 100 per cent of all villages with population above 1000 and
  - 75 per cent of all villages with population between 500-1000

- **Hilly areas:**
  - 100 per cent of all villages with population above 500 and
  - 75 per cent of villages with population between 200-500
• **Tribal, coastal, riverine and desert areas:**
  
  o 100 per cent of villages with population above 500 and
  
  o 75 per cent of villages with population between 200-500.

• **Bharat Nirman:**

  It is a flagship programme of the Government of India conceived as time bound business plan to provide rural infrastructure during 2005-06 to 2008-09.\textsuperscript{15} Six major rural infrastructure namely, rural roads, telephone connection, irrigation, water supply, housing and electrification are identified and over Rs.1,74,000 crore has marked for development. The programme was initiated during the year 2005-06, under rural road component, it targeted to provide all weather connectivity to all habitations having population of 1000 or more (500 or more in hill, tribal and desert areas) by 2009. While the primary objective of PMGSY has been to provide *last mile connectivity* to all eligible unconnected habitations, it also includes an up-gradation component in order to ensure farm to market connectivity. It is pertinent to mention that the rural road component of the Bharat Nirman programme is actually embedded in the PMGSY with the target for the connectivity to habitations with 1000 or more
population. Thus, the rural road component is concomitant to PMGSY with wider funding base and extended scope. Bharat Nirman envisages a massive scaling up of the programme in terms of habitation connectivity coverage, construction targets and financial investment.

**Road Development Plan Vision-2021:**

The Road Development Plan Vision-2021 has been brought out to guide the Central and State Governments in developing the road infrastructure of adequate standards in the country. The strategy proposed in the vision document for planning rural roads emphasized the need for preparation of master plans for rural road network in each district. The planning of network for the district may cover all habitations with minimum population of 100 and above to be served by all-weather roads.
Table 3.02:

Vision 2021 - Target for Connectivity of Villages.

<table>
<thead>
<tr>
<th>Villages (population category) to be connected by all-weather roads</th>
<th>Target Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Villages with population above 1000</td>
<td>2003</td>
</tr>
<tr>
<td>Villages with population 500-1000</td>
<td>2007</td>
</tr>
<tr>
<td>Villages with population below 500</td>
<td>2010</td>
</tr>
</tbody>
</table>

(Source: Road Development Plan-Vision 2021)

Table No.3.02 presents the prioritized targets for the provision of all-weather roads. It also suggested for providing connectivity to all the habitations by the end of the year 2010. The Vision also gives priority by way of special attention to the coastal regions, tribal areas, deserts and hill areas for road development in general. It has also recommended for consideration to improve the existing fair-weather roads to all-weather standards, by providing adequate cross drainage structures wherever they are missing and also for completion of works in progress.
- **Role of Planning Commission in Road Development:**

  Rural roads are playing a vital role in socio-economic upliftment of rural community.\(^{16}\) They contribute significantly in rural development by creating opportunities to access goods and services located in nearby villages or major market centers. Provision of rural roads increases mobility of men and materials thus facilitating economic growth. These, in turn, assist in reducing poverty and leads over all social development. Rural roads are the tertiary road system in total road network which provides accessibility for the rural habitations to market and other facility centers. In India, during the last five decades, rural roads are being planned and programmed in the context of overall rural development, and tried to provide all-weather connectivity with some level of achievement. The long term road development plans for the country provided policy guidelines and priorities for rural roads, while the funds for rural roads were allocated in the Five Year Plans.\(^{17}\) Following are the major functions of the Transport Division:
- **Transport:**

- Addressing policy issues concerning railways, roads, road transport, shipping, ports, inland water transport and civil aviation for improving efficiency and making these sectors more responsive to the present and future requirements of the country.

- Addressing inter-modal issues for improving coordination among different transport sectors and ensuring that each sector works according to its comparative advantage and efficiency.

- Organizing Quarterly Performance Review Meetings for different transport sectors to monitor progress of transport sector projects according to Plan priorities and targets.

- Carrying out zero-based budgeting in consultation with various transport sector Ministries to improve efficiency and utilization of resources according to Plan priorities and objectives.

- Work relating to Parliamentary Committees for different transport sectors.

- Examining Five Year and Annual Plan proposals received from the States, Union Territories and North Eastern Council in respect of transport sectors.
• Discussions with the representatives of the State Governments and Union Territories to review physical targets, programmes and outlays of Five Year and Annual Plans of States and Union Territories.

• Examining the proposals of State Governments for provision of Additional Central Assistance.

• Participation in various workshops and seminars relating to the transport sector.

• Formulation, appraisal and monitoring of Five Year and Annual Plans.

• Mid-term review of Five Year Plans.

• Providing inputs for the Working Group Reports on the various transport sectors; preparing Steering Committee Report on Transport Sector.

• **Roads:**

• Evaluation of project reports for consideration of Public Investment Board, Expenditure Finance Committee/Standing Finance Committee.
- Examination of schemes received from the Ministry of Road Transport & Highways for clearance of the Planning Commission relating to National Highways, Strategic roads, Roads of Economic and Inter-State importance, road development in sensitive border areas and tribal roads.
- Review and Monitoring of National Highway Development Project comprising Golden Quadrilateral and North-South, East-West corridor projects.
- Examination of proposals from various States in the North-Eastern region for providing assistance through Non-lapsable Central Pool of Resources.
- Examining proposals received for the consideration of High Powered Committee on BOT projects.
- Examining proposals relating to National Highway Development Project for consideration of National Highways Authority of India Board.

- **Road Transport:**

  - Analytical review of operations and assessment of financial resources of Road Transport Corporations of various States.
• **Pradhan Mantra Gram Sadak Yojana (PMGSY):**

On the recommendations of the *National Rural Road Development Committee*, Government of India has undertaken a dedicated programme known as ‘*Pradhan Mantra Gram Sadak Yojana (PMGSY)*’ on the 25th December 2000 to provide rural connectivity to all habitations under the Ministry of Rural Development. More recently, Bharat Nirman, a time bound business plan adopted to provided rural infrastructure during 2005-09, rural roads have been taken as one of the components and blended with PMGSY programme. It targeted to provide connectivity to all habitations having population of 1000 and above (500 and above in hilly, desert and tribal areas) by 2009 and also aimed to upgrade the existing rural roads for overall network development, which is a more objective approach. Rural roads have been proved to be catalytic for economic development and poverty alleviation in rural areas; this objective should be pursued further with more vigor. In future, the target should be to connect all habitations with all-weather rural roads instead of fair weather roads which were done earlier.
• **Objectives of PMGSY:**

The main objectives of the programme are to construct good quality all-weather roads for new connectivity and up-gradation of existing roads. For the first time the focus is directly on the rural connectivity under dedicated road fund, and the 50 per cent of the cess amount collected on high speed diesel has been allocated for this programme. In earlier programmes, the village with a defined population was the target for providing connectivity, while the PMGSY envisage ‘habitation’ as the unit, to reach out to more settlements and more people with accessibility. The programme aimed to provide connectivity to all habitations up to 500 and above population in plain and in respect of hilly, desert and tribal areas the habitations with 250 and above population is targeted. It was planned to provide connectivity in a phased manner. In the general order of priority for connectivity, first priority is accorded for new connectivity. The order of priority for new connectivity and up-gradation is given in Table No. 3.03.
Table No. 3.03:

Priority for new connectivity and up-gradation.

<table>
<thead>
<tr>
<th>Priority</th>
<th>Population size of Habitations being connected</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>1000 and above</td>
</tr>
<tr>
<td>Second</td>
<td>500 – 999</td>
</tr>
<tr>
<td>Third</td>
<td>250 – 499 * (hilly, backward and special areas)</td>
</tr>
<tr>
<td>Fourth</td>
<td>Up-gradation of through routes</td>
</tr>
<tr>
<td>Fifth</td>
<td>Up-gradation of selected link roads</td>
</tr>
</tbody>
</table>

*Source: [www.pmgsy.org.in](http://www.pmgsy.org.in)*

The programme is being coordinated at Central level by the National Rural Development Agency (NRRDA) through Ministry of Rural Development, Government of India. At State level the programme is executed through agency known as State Rural Road Development Agency (SRRDA). At the District level, the programme is planned, coordinated, and implemented through the executing agencies known as Programme Implementation Unit (PIU). The programme is being implemented by preparing the detailed district
level rural road plan and the core network by the PIUs, which provide prioritized links for connectivity of rural habitations satisfying the qualifying population criteria. These plans are approved at various levels. Detailed project reports (DPR) are prepared for the prioritized links by the PIUs for execution. The DPRs are scrutinized by the selected State Level Technical Agencies before their approval by the State and Central level agencies. The projects are implemented by the PIUs and are monitored by a three tier quality control system.

Guiding Principles and Definitions:

- The spirit and the objective of the PMGSY are *to provide good all-weather road connectivity to the unconnected habitations*. It must be ensured that provision of new connectivity should be given precedence in keeping with the objectives of the programme.

- An unconnected habitation is one with a population of designated size located at a distance of at least 500 meters or more from an all-weather road or a connected habitation.
- **The unconnected habitations are to be connected to nearby habitations already** connected by an all-weather road or to another existing all-weather road so that services, which are not available in the unconnected habitation, become available to the residents.

- The unit for this programme is a habitation and **not a revenue village or a Panchayat**. A habitation is a cluster of population, living in an area, the location of which does not change over time.

- A core network is that minimal network of roads that is essential to provide basic access to essential social economic services to all eligible habitations in the selected areas through at least **single all-weather road connectivity**.

- **A core network comprises of ‘through routes’ and ‘link routes’**. Through routes are the ones which collect traffic from several link roads or a long chain of habitations and lead it to marketing centres either directly or through the higher category roads i.e., the District Roads or the State or National Highway. Link routes are the roads connecting a single habitation or a
group of habitations to through routes or District Roads leading to Market Centres.

- It should be ensured that each road work that is taken up under the PMGSY is part of the ‘Core Network’. While keeping the objective of connectivity in view, preference should be given to those roads which also incidentally serve other habitations. In other words, without compromising the basic objective, preference should be given to those roads which serve a larger population. For this purpose, while habitations within a distance of 500 metres from the road is considered as connected in case of plain areas, this distance should be 1.5 km in respect of Hills.

- The PMGSY shall cover only the rural areas. Urban roads are excluded from the purview of this programme. Even in the rural areas, PMGSY covers only the rural roads i.e., roads that were formerly classified as ‘Other District Roads’ and ‘Village Roads’. Other District Roads are roads serving rural areas of production and providing them with outlet to market centres, taluka headquarters, Block headquarters or other main roads. Village roads are roads connecting villages or groups of
habitation with each other and to the nearest road of a higher category. Major District Roads, State Highways and National Highways cannot be covered under the PMGSY, even if they happen to be in rural areas. *This applies to new connectivity roads as well as up-gradation works.*

- The PMGSY envisages only single road connectivity to be provided. If a habitation is already connected to another connected habitation by way of an all-weather road, then no further work can be taken up under the PMGSY at that habitation.

When the PMGSY was launched in 2000, it was estimated that about 3,30,000 habitations out of a total of 8,25,000 habitations were without any all-weather access. As per the initial estimates at the time of launching PMGSY, about 1,60,000 habitations were expected to be covered under the programme with an anticipated investment of Rs.60,000 crore. According to latest figures made available by the State Governments, after a detailed survey undertaken to identify core networks there are about 1.73 lakh unconnected habitations and about 3.65 lakh km new road
connectivity are required to be taken up under the PMGSY programme as per the norms. The requirement of fund and length in km were estimated for the up-gradation of the existing roads as per the guidelines. The total up-gradation requirement is about 3.73 lakh km of rural roads with an estimated cost about Rs.590330 million as per PMGSY norms. The total estimated habitations according to population size, and the road length and cost of construction are given in Table No 3.04.

Table No. 3.04:
Estimated Road Length and Fund Required for New Connectivity as Per PMGSY Norms.

<table>
<thead>
<tr>
<th>Habitation Population Group</th>
<th>Number of Rural Unconnected Habitations</th>
<th>Length Required (km)</th>
<th>Estimated cost (Rs billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000+</td>
<td>59,855</td>
<td>133,949</td>
<td></td>
</tr>
<tr>
<td>500-999</td>
<td>81,466</td>
<td>161,955</td>
<td>784.18</td>
</tr>
<tr>
<td>250-499 *</td>
<td>31,451*</td>
<td>69,901*</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>172,772</td>
<td>365,805</td>
<td>784.18</td>
</tr>
</tbody>
</table>

Source: (www.pmgsy.org.in)

Note: * Only in hill states, desert and tribal areas as per PMGSY eligibility criteria.
• **District Rural Road Plan Under PMGSY:**

Under PMGSY the investment for new construction and upgradation are being assessed by preparing a district level rural road plan and core network of rural roads. The District Rural Road Plan (DRRP) is a compendium of the existing and proposed road network system in the district which clearly identifies the proposed roads for connecting the yet unconnected habitations to already connected all-weather roads in an economic and efficient way in terms of cost and utility. It is also known as Master Plan for Rural Roads for the district. Preparing maps and database on habitations and road details for each Block, such maps are integrated at District level to form the District Rural Road Plan. Detailed guidelines were prepared by the Ministry of Rural Development and circulated to the State agencies.

The Core Network is a subset of DRRP which provides the basic access to all villages with one all-weather road to the near by market centre or rural business hub and essential social and economic services. It comprises of ‘*Through Routes*’ and ‘*Link Routes*’. Through routes are the ones which collect traffic from several link roads or a
long chain of habitations and lead it to a market centre or a higher category of roads. Link routes are the roads connecting a single habitation or a group of habitations to Through Roads or Major Road leading to market centre. Links routes generally will have dead ends terminating on habitations, while through routes arise from the confluence of two or more link routes and emerge on to a major road or to a market centre. All State agencies have already prepared the DRRP and Core Network and currently, funds are being allocated based on these plans. After the Block-wise Master Plan has been approved by the Block level Panchayat, it would be forwarded to the District Planning Committee, where the Block Plan would be integrated into the District Master Plan, called District Rural Roads Plan. This would be placed before the District Panchayat for consideration and approval. After approval this would become the final District Rural Roads Plan, and would form the basis for selection of road works under PMGSY, through core network work. This plan may be considered for all rural road development programmes.

- **Intra-village Roads Under PMGSY:**

  Generally, it is known that travel needs of the different segment of rural population are different, and for poor and women the travel
needs are mostly concentrated with the village to fulfill their basic requirements. These movements can be classified as intra-village movements. The intra-village road serves these purposes. Intra-village road include the roads connecting different habitations within a revenue village, roads in the built up areas of a habitation and road leading to a facility location such as school, dispensary, drinking water, community centre, etc located in the village. Therefore, the rural roads network development should also consider this component. Appropriate techniques and standardization for network planning, design, standards, specifications and quality assurance system should be separately identified since these roads are expected to carry very low traffic. In some of the States, the Panchayat institutions are developing these roads under various rural development programmes without adopting proper standards and design procedures. It is necessary to develop appropriate standards and specifications by keeping in mind that the roads constructed are amenable for stage constructing facilitating upgrading them at a future date.
• **Detailed Project Report Under PMGSY:**

Each rural road project, whether new construction or upgradation of an existing road should have a separate feasibility and Detailed Project Report (DPR). The DPR should be based on the detailed survey and investigations and designed with choice of technology. The guidance for preparation of the DPR may be taken from IRC and other relevant IRC Codes of practices along with all data supported by necessary investigations and the maps/drawings. The cost and quantity estimates should be based on the schedule of rates, which will be prepared using the MORD specifications and Standard Data Book (SDB) for analysis of rates for rural roads. Under PMGSY, the DPR prepared by the executing agencies are being scrutinized by the State technical agencies before it is being approved. The system should also continue during the 11th Five year Plan Period not only for proposals under PMGSY but also for other major programmes and schemes under taken by the States.
<table>
<thead>
<tr>
<th>Scheme</th>
<th>Plans prepared by</th>
<th>Sanction</th>
<th>Fund Release</th>
<th>Implementation</th>
<th>Monitorin g &amp; Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMGSY</td>
<td>The Rural Roads Plan and the Core Network would constitute the basis for all planning exercises under the PMGSY. The Block level Master Plan and the Core Network are placed before the Intermediate Panchayat for consideration and approval of the Core Network. They are simultaneously sent, along with the list of all unconnected Habitations to the MP and MLAs, for their comments, if</td>
<td>State level coordination committee clears the district proposals and forward to NRRDA. After scrutiny, these proposals are placed before Empowered Committee to be chaired by Secretary. The representatives of the State Government whose proposals are being considered by the Empowered Committee</td>
<td>The funds for the cleared projects are made available to the SRRDA in two installments. The first installment amounting to 50% of the cleared value of projects is released subject to fulfillment of conditions, if any, stipulated earlier. The SRRDA selects a Bank branch with internet connectivity at the State Headquarters, of any Public</td>
<td>At the District level, the Programme will be co-ordinated, and implemented through a dedicated Programme Implementation Unit (PIU). All PIUs will be manned by competent technical personnel from amongst the available staff or through deputationists. Contract Works are</td>
<td>The designated Executive Engineer is responsible for ensuring placement of all Master data including the Rural Roads Plan in the database and for the constant updating and accuracy of data relating to the progress of road works, record of Quality control tests as well as the payments made.</td>
</tr>
</tbody>
</table>
any. After approval by the Intermediate Panchayat, the Plans would be placed before the District Panchayat for its approval. are invited to attend the Meetings, as and when required. The proposals meet the programme requirements are cleared. Sector Bank for maintaining the Programme Account, Administrative Account and Maintenance Accounts under the PMGSY. finalized based on online bidding or e-tendering

The District Vigilance and Monitoring Committee set up by the Ministry monitors the progress and exercise vigilance in respect of PMGSY. There is also Online monitoring system for continuous updation.

(Source: www.pmgsy.org.)

- **Rural Roads Pavement Performance:**

  Rural road caters for low volume of traffic, and serving in various climatic regions in India, it is felt that such performance based design method will prove to be more economical rather than the conventional method of designing rural roads. Therefore, NRRDA has initiated a research and development programme on ‘Rural Roads
Pavement Performance Study (RRPPS) in selected States with an aim to develop performance data and to develop performance based design and specifications of rural roads for Indian condition. The results of such studies will provide ways and means to devise design methods based on the performance observation during the last few years by researchers. The 11th Plan should aim to develop design methods based on these results, which may economies in design of rural roads, thereby saving in construction cost. The design of rigid pavement of rural roads including that of block pavements and roller compacted cement concrete have been brought by the Indian Roads Congress is being recommended for implementation of rural road programme. The roads constructed under PMGSY follows the set standards for designing of rural roads; it is also recommended that adoption of uniform design standards for all rural roads irrespective of the source of funding.

- **Materials for Roads Under PMGSY:**

  The rural roads are essentially low cost roads, the specifications for pavement materials in various layers should be as economical as possible, consistent with the traffic expected to use the road and the
climatic condition. The local materials which are cheaper and involve minimum haulage should be used to maximum extent feasible. A detailed mapping of these local materials has to be carried out using the satellite image processing and remote sensing technologies. For road construction, the conventional materials required are soil, stone aggregates, bitumen, cement and steel. Considering the targets of new construction and up-gradation of about 4 lakh km of rural roads during the 11th plan period and periodic maintenance of about 2 lakh km per year, broadly the materials required would be: aggregate about 24.3 million cum, bitumen 0.9 million tonne per year and cement 0.5 - .035 million tonne per year.26 The requirement of these materials on other construction sectors would be far greater. Nevertheless requirement for rural roads is also considerable. Accordingly, there is a need to reduce the consumption of construction materials of high quality and initiative be taken to use of locally available materials which can satisfy the design requirement of rural roads.

The non-conventional road construction materials are the industrial waste and by-products such as fly-ash from thermal power
plants, iron and steel slag, marble dust from quarry, Phospho-gypsum – a by-product of phosphoric acid based fertilizer plants, processed municipal wastes, jute and plastic wastes. Many organizations carried out research work to develop specification for these materials. These materials can be used as replacement for the conventional materials wherever they are available in abundance, this will not only reduce the cost but also preserve the precious environment around the industries.

- **Construction Methods and Technology:**

  Road construction techniques have been constantly upgraded and use of new and alternative materials as well as modern equipments is advocated for all types of roads. The purpose of road construction is to provide a firm, durable and even surface of pavement, which could stand the stresses imparted due to traffic and climatic conditions. The construction techniques for rural roads could be broadly classified as: (i) conventional, (ii) mechanized and (iii) intermediate. Since rural roads are to be considered as engineering assets, they are required to be properly designed and constructed
with high quality. This can be achieved only if proper use of high end equipment for bulk construction of road works.

- Traditional Methods and Technology:

The current practice of construction and maintenance of rural roads continue to be traditional. Though there is an increasing awareness regarding the need of maximizing use of locally available materials, adoption of soil stabilization techniques and relevance of sealed gravel roads for low volume traffic conditions, cost effectiveness practices have not yet found favour in most of the rural road construction. Deployment of equipment/plant by and enlarge is the same as is being used for higher category of roads. State may have a mechanism of interacting with financial institutions, contractors and equipment manufacturers to facilitate the availability of required machinery for construction and maintenance of rural roads.

- Labour-based Technology:

Road construction and maintenance using labour-based technology promises to be a good avenue for creating employment potential while building productive assets. Many of the operations
involved in rural road construction on such as excavation, embankment construction, soil-stabilization, surface dressing, maintenance operations like trimming of beams and cutting grass and weeds, are easily amenable to be undertaken by manual means with support of light equipment. Provision of better tools to enhance the productivity of labour and training of the work-force will help in the process. International experience from China and several African countries suggests that most of the operations involved in the construction and maintenance of Rural Roads can be efficiently performed by labour, aided by simple implements to increase their productivity.27

- **Intermediate Construction Technology and Equipment:**

  The construction of rural roads in our country is largely with conventional techniques and is labour intensive. However, these techniques are slow and often result in sub-standard quality of finished product. On the other hand, machine based technologies are capital intensive and hence cannot be pressed for low volume rural road construction. Keeping in view the importance of employment
opportunities and at the same time ensuring a minimum standard quality necessitates adoption of intermediate technology. A study on use of tractor-powered technology using locally available agricultural machinery, tractors-tiller was developed. The important operations such as loosening the soil for excavation, site clearance, loading and unloading, pulverization, mixing of additives, watering, spreading of soil, additives, leveling of soil at desired camber and compaction can be done with such a machinery. Normally, these equipments remain idle in the agricultural fields for a considerable time in rural areas during sowing-harvesting cycles and therefore facilitate their use with no further investment and simultaneously getting better productivity of existing machinery.

• **Employment in Rural Road Sector:**

Road construction activities generate direct employment opportunities for the skilled, unskilled labourers and also provide an opportunity for local entrepreneurship to supply the procurement of rural road project activities. The labour employment opportunity is mainly depends upon the construction technology. The technology is also decides proportion of labour, material and equipment usage in
road works. Depending upon the sites and availability of labourers the labour-based methods are well suited for site clearance, earthwork, short hauling, and aggregate preparation. Even bituminous work also generates labour employment. Rural roads should be constructed by adopting the Intermediate Technology. An expenditure of Rs. 1 crore in rural roads is likely to create 40,000 man-days of employment. Taking into account the assessment of investments required in construction and maintenance of rural roads during the plan periods, the employment in terms of man-days likely to be generated is in tune of 440 million man-days. There are many spin-offs that can be expected from the rural road programmes that can lead to the creation of additional jobs. These are:

- creation of better avenues for self-employment;
- on-farm employment opportunities due to shift in cropping pattern;
- non-farm opportunities like grocery shops, tea stalls, small businesses and cottage industries;
- expansion of health, education and agro-based industries.
Table 3.05:
Category wise Unconnected Habitations to be covered under PMGSY in different States.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name the State</th>
<th>Total No of Habitations</th>
<th>No. of Eligible Unconnected Habitations</th>
<th>Total to be covered under PMGSY</th>
<th>% eligible Unconnected Habitations</th>
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<td>859102</td>
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<td>78084</td>
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</table>

(Source: Rural Development Report – 2008-09 – Govt. of India)

- **Role of Panchayati Raj Institutions (PRI) in PMGSY:**

  The State Governments have brought the rural road sector under the Rural Development Departments. This may help in implementing the projects with effective local participation in planning, implementation and maintenance of rural roads. These departments are lacking in appropriate technical manpower to carry out the tasks of planning and building all-weather rural roads for large number of projects. Local community involvement at each stage of planning process is needed for selection of optimal and desired links for connectivity.
For effective delivery of rural infrastructure by the PRI, they need to be provided with adequate technical support. A separate Rural Roads Wing should be set up in each state. This Wing may be brought under the Panchayat Raj Department of the State. The Executive Engineers in the field should be working directly under the District Panchayats, and they should be responsible to the Panchayats for all administrative matters. However, for all technical matters, the field Executive Engineers should report to the Superintending Engineers/Chief Engineer of the Rural Roads Wing. Like in PMGSY, there should be one Project Implementation Unit (PIU) in each district, capable of handling capital works to the tune of Rs.100-200 million per year and maintenance works to the tune of Rs.50 million per year.\(^\text{30}\) If the existing system of SRRDA/PIUs can act as a single agency for rural road development in any State, then their existing linkages with the PRIs at different levels should be further strengthened.

The rural road works are by nature small and dispersed over a wide geographic area in blocks. Such works are difficult to supervise due to the demanding travel and logistics requirements. This has led
to the need of decentralization of responsibility for provision and maintenance for rural roads to Panchayati Raj Institutions. For discharge of functions, expected of these PRIs, some states have set up full-fledged Rural Engineering Service/Department to undertake all engineering works entrusted to the Panchayats. Some others entrust the works for execution to the Public Works Departments since they have a battery of experienced technical personnel and well laid down procedures for engagement of contractors and their in-house capability in monitoring of quality during execution.

- **Importance of PMGSY in Rural Development:**

  Rural population migrates near by city due to more employment opportunities and better facilities. Similarly, the limited capacity of rural economy to accommodate the increasing population disregards the labour force as surplus to migrate large cities. Thus there is a need to encourage reverse migration to rural areas through proper development of rural infrastructure and basic amenities by creation of income generation avenues, improving the quality of life, etc.
The development of rural infrastructure is crucial for the sustainable development of rural economy as well as welfare of the rural poor. Sustainable Rural Development requires not only individual efforts of the countries but also cooperation between and among countries on issues which are of common concern. Rural Roads are vital to economic growth and a measure for poverty alleviation in the villages. Inadequate rural Connectivity and lack of mobility pose serious constraints to accelerated rural development. Rural Road Connectivity is an extremely important aspect of rural development. The critical role played by roads in economic development is now being realized. Keeping in view the fact that Rural Roads are vital to economic growth and measures for poverty alleviation in the village, Government of India have launched a 100 per cent Centrally Sponsored Scheme called the Pradhan Mantri Gram Sadak Yojana. The Programme seeks to provide connectivity to all unconnected habitations in the rural areas with a population of more than 500 persons through good All-weather roads by the end of the Tenth Plan Period. The Pradhan Minister's Gram Sadak Yojana is an example of this healthy development.
Development of Infrastructure in rural areas is a thrust area to create values through engineering consultancy. Engineering consultancy can provide technical, managerial and on-site consultancy from conceptualization to final implementation of the projects. Various infrastructure projects under Bharat Nirman have become lifeline to new markets, new business, new incomes, and above all, to new opportunities. Even a narrow road can be a highway to prosperity. Similarly each infrastructure project has its own advantages particularly rural connectivity Yojana ensure that every village in India has access to markets, to services, to opportunities, indeed, to prosperity.

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