Maintenance Study
In the Philippines
Poverty alleviation, rural infrastructure planning and construction, rural roads maintenance, decentralisation, good governance.

ASIST AP Rural Infrastructure Publication


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In the Philippines
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Acknowledgement

This study on rural roads maintenance practices in the Philippines is a joint effort of the ILO ASIST-AP and the ADB-DA Infrastructure for Rural Productivity Enhancement Sector (InfRES) Project. A team of national consultants led by specialist Nori T. Palarca, and area-based experts Henry Afable, Evan Anthony Arias, Ricardo Herrera, Elizabeth Barbaso and Millie Bueta, collaborated in producing the original version of the report. The current version has undergone further development with editing contributions from Geoff Edmonds of ILO ASIST-AP.

Sincere gratitude is extended to Chris Donnges for the practical and valuable inputs and to Martha Mildred D. España for the efficient coordination. Likewise, the DA InfRES Project headed by Undersecretary Edmund J. Sana, Project Coordinating Office headed by Mr. Nestor F. Estoesta and the InfRES Project Office headed by Mr. Graham Johnson-Jones, are acknowledged for the cooperation extended to the team during the study. Deep appreciation is also expressed to Director Werner Konrad Blenk of the ILO Sub-Regional Office Manila for the support in presenting the outcome of the research, and to the DILG Rural Roads Development Project headed by Ms. Rosalina Ilaya for providing significant information from the ADB-DILG Rural Roads Development Policy Framework Project.

To the heads and technical staff of Provincial and Municipal Engineering Offices who shared information, experiences and views, to the Local Chief Executives who graciously accommodated the members of the team, to the Barangay Chairpersons and members of the Barangay Councils and key informants who spent time and described actual conditions in their respective areas, THANK YOU VERY MUCH.
Rural road maintenance is a major issue for both Governments and
financing and donor agencies. The basic problem is that millions of dollars
are invested in the construction and rehabilitation of rural roads every year.
However if these roads are not maintained the roads will deteriorate rapidly
making the roads impassable and resulting in the assets created being lost in
a short space of time. For the ILO the subject is important because rural
road maintenance is a major source of off farm employment in the rural
areas.

ASIST AP is the ILO's regional programme to mainstream poverty
reduction and decent work strategies through sustainable infrastructure
provision. The sustainability of rural infrastructure is one of the four focus
areas of work. ASIST AP has commissioned several studies on rural road
maintenance in the region. This study on the Philippines forms part of the
work being carried with the Department of Agriculture through the
Infrastructure for Rural Productivity Enhancement Project with funds from
the ADB.

The study was carried out by a team of local consultants led by Nori
Palarca. Geoff Edmonds, Programme Coordinator of ASIST AP, provided
both technical input and final editing.
Executive Summary

1. Under an Agreement with the Department of Agriculture, the ILO ASIST AP programme is providing support in the implementation of the ADB funded Infrastructure for Productivity Enhancement Sector Project. As part of this work, it was asked to assess the capacity and ability of the Local Government Units to maintain the roads that are rehabilitated under the project. It was agreed that to carry this out effectively it was necessary to understand more fully the current situation in relation to the maintenance of rural roads. This study was commissioned to assess the situation. It was carried out in 5 Provinces, three of which were involved in the INFRES project.

2. Relatively little serious examination of rural road maintenance has been carried out in the Philippines. This partly because the responsibility for this activity was decentralised to the Local Government Units (LGUs) under the 1991 Local Government Code. Consequently, whilst the overall responsibility for rural roads rests with the Department of Local Government, there has been no coordinated response to the rural road maintenance problem. It is also, as the study shows, because there is very little understanding of the importance of maintenance.

3. One of the difficulties of any study on rural roads in the Philippines is the lack of reliable data whether this is financial or technical. It is for example estimated that there are some 120,000 km. of Barangay (basically farm to market) roads in the country servicing the 41,969 barangays. However, the length of road is not based on any reliable data. Moreover what percentage of the total that does exist remains in a trafficable condition is not known with any degree of confidence.

---

1 Rural roads comprise for the purposes of this study provincial, municipal and barangay roads  
2 An exception to this was the 2003 DILG report entitled "Rural Roads Maintenance Policy Framework"
One of the limitations of this study is that, despite holding key informant discussions at the LGU level, accurate data was at a premium.

4. Rural roads are the veins of the road network. They are the last vital link connecting (mainly rural) households to markets and other economic and social services. They are a key element in any poverty reduction strategy given that lack of access is a key indicator of poverty. More specifically without reasonable access farmers have difficulty transporting their crops to market with obvious financial losses both to the individual and the nation.

5. Rural roads are also a national asset. At a reasonable estimate the asset value of the estimated 120,000 km of barangay roads in the country would be of the order of 100 billion pesos ($1.8 Billion). Very few of these assets receive any significant maintenance. Consequently the value is decreasing every year. A conservative estimate would be that the asset is decreasing at the rate of 15 billion pesos per year.

6. The shortfall between the amount required for maintenance of provincial and barangay roads and that actually being allocated is of the order of 7 billion pesos. However whilst funds are allocated for maintenance only a small portion is actually spent on maintenance activities. There is certainly "leakage" of funds. However much of the money allocated for maintenance is actually spent on rehabilitation or emergency works.

7. The study showed that there is a general lack of understanding of the need for preventive maintenance. The concept that roads need to be maintained to ensure that they do not deteriorate is alien to many dealing with the roads in the LGUs. Roads are "maintained" when they are deteriorated to such an extent that they are impassable or seriously damaged. This is illustrated by the fact that often where maintenance is mentioned as a budget item it refers to a specific remedial activity such as reforming or concreting a section of road.

8. The study intended to obtain information on how much money was spent at the LGU level on rural road maintenance. This proved to be an almost impossible task. Because road maintenance is not viewed nor treated as a recurrent expense, the money that is used for maintaining roads is not allocated from a standard budget line. It may form part of the general fund for maintenance of public assets, be
included with budgets for rehabilitation of roads or identified as a specific activity of concreting or reshaping a particular road. However it is very rarely identified as a recurrent budget item.

9. The information on funds available at Municipal and Barangay levels shows that after expenditures for personnel are taken out there is very little left. The LGUs rely to a great extent on the Internal Revenue Allotment for development activities. Any funds for maintenance would also generally come from the IRA.

10. It is also hard to see how the barangays could maintain their roads with the money that is available to them. The maintenance of the average of three km of road in a Barangay would cost some 150,000 pesos. This represents between 20-30% of the annual budget.

11. In one Province in the study, Zamboanga del Norte, the maintenance, at least of provincial roads, is viewed as a recurrent operation and separate budgets are allocated for the purpose.

12. A further problem at the barangay level is that the length of barangay roads under their jurisdiction is very small (an average of 3 km per barangay) and consequently it is not considered necessary to either plan or budget for it.

13. What is clear especially to those who have to travel on the roads is that very little money is spent on maintenance. Unfortunately, even if sufficient funds were available, money, though important, is not the major problem.

14. In the first place the responsibility for barangay road maintenance has been devolved to the barangays. At this level of government there is very little technical capacity of any kind to carry out the work. The study illustrates that there is no planning for maintenance and even if there were there is no technical capacity to implement the work. Whilst road maintenance is not a complicated technical issue, it still requires a certain level of technical input which the barangays do not possess.

15. The lack of clarity of the location of responsibility can be exemplified by the case of externally funded programmes or major national government programmes which involve the rehabilitation of rural roads and in particular barangay roads. In general these programmes
would be designed and planned at the level, usually provincial, where there is the technical capacity to do so. Thus a programme of road reconstruction will be approved on the assumption that maintenance will take place. However the LGU responsible for maintenance, the Barangay, will rarely have been involved in the design of the programme and does not have the capacity to maintain the roads to be reconstructed.

16. Agreements made between externally funded projects and either Provinces or Municipalities to ensure the maintenance of barangay roads have little validity given that neither LGU is mandated to fund the activity.

17. The situation therefore is that whilst barangay roads constitute half the total length of the road network of the country, their maintenance is delegated to the barangays which have the least in terms of resources and technical capacity.

18. From the technical point of view barangay road maintenance also suffers. Because of the lack of technical capacity, road inventories are not updated, road condition surveys are not carried out to any significant degree and the use of credible mapping is also limited. Even if maintenance planning were to take place it would have little reliable data on which to be based.

19. Another often heard complaint was that the local chief executive will decide where the money is to be spent so there is little incentive to plan the use of resources.

20. The key areas that need to be addressed therefore are awareness raising, institutional responsibility, finance and capacity building.

21. Advocacy - It is vital to create awareness amongst all the stakeholders in the road sector - politicians, planners, engineers, administrators and the beneficiaries - the importance of recurrent road maintenance. The most direct way to do this is to illustrate that national assets worth billions of pesos are being wasted because of a lack of willingness or capacity to spend a small proportion of the value of these assets on maintenance.

22. Institutional responsibility - It seems illogical to allocate responsibility for the maintenance of half the road network to units which are incapable of carrying out the task. Reallocating the responsibility to either Municipalities or Provinces would be logical. However how this
would be done practically would need to be looked into. It is worth mentioning that the responsibility for the maintenance of barangay roads has over the years been passed between different agencies.

23. Finance - Clearly finance is a problem. Even if it were recognised that rural road maintenance needs to be budgeted as a recurrent item, in practice the demands on the budget at whatever level of LGU are such that there would be no guarantee that the requisite funds would be allocated to maintenance.

One solution would be to set up a dedicated rural road maintenance fund at Provincial level for the maintenance of rural roads. This has been effectively operated elsewhere in the world. Naturally it would depend on realistic estimates being made of the size of such fund which in turn implies both a proper understanding of the condition of the rural road network and the use of effective maintenance planning tools.

24. Capacity building - The study clearly indicates that technical capacity at the municipal and particularly the barangay level is very limited. Wherever the responsibility eventually is lodged for barangay road maintenance there will be a need for training in the importance of maintenance and in the detail of planning, budgeting and implementing the works. Clearly, providing training to some 42,000 barangays is unrealisitic. However basic simple guidelines have already been prepared under the auspices of various projects over the past 10 years and these could be distributed though the regional training programmes of the Local Government Academy. In addition the LGA could be the vehicle for training in maintenance at the Provincial level. Moreover the League of Provinces or the Association of Provincial Planning Development Officers could also be involved in such a programme.

25. Unfortunately road maintenance is not highly visible, carries little glamour and is generally only recognised when it is lacking. The choice is stark however. Continue as at present and lose more in the deterioration of the network each year than is being rehabilitated. Or, develop a system of recurrent road maintenance to safeguard the nation's assets and sustain the access of the rural population.
1.1 Background

The International Labour Organization Advisory Support, Information, Services and Training Asia-Pacific (ILO ASIST-AP), as part of its commitment to the Asian Development Bank-Department of Agriculture (ADB-DA) Infrastructure for Agricultural Productivity Enhancement Sector (InfRES) Project, conducted a study on the country's rural roads maintenance practices and procedures.

The study covers the technical, financial and institutional elements surrounding rural roads operations and maintenance. Actual LGU experiences and practices were examined to help identify issues, problems and concerns for the recommendation of appropriate and relevant actions.

The technical element addresses issues related to defining the type and frequency of maintenance required on rural roads, how and to what degree this work is efficiently carried out, choice of technology, and the adequacy of current work organization and management arrangements at the LGU level to cater to current and future performance requirements.

The financial element provides an overview of the current resources available for rural road maintenance at the LGU level identifies and reviews the various funding mechanisms and discusses any current and future shortfalls.

The institutional element reviews the divisions of responsibility for all aspects of maintenance planning, budgeting and implementation for the various classifications of roads in The Philippines. This comprises the responsibility for the collection of physical data, network planning, budgeting, plan and budget approval, the provision of resources and funds, standard setting, the authority to classify, the implementation of improvement works, supervision, the award of contracts and monitoring and accounting. This component also discusses capacity deficiencies at various parts of the organisations in charge of maintenance, and proposes how capacity development can be organised.
1.2 Objectives

The study aims to provide a better understanding on how local government units (LGUs) manage rural road assets. The outcome is expected to contribute to a framework for the effective provision of maintenance of the rural road network.

1.3 Research Team

The research team comprised a team leader and 5 area-based consultants. The area-based consultants (ABCs) looked at the prevailing conditions on rural roads operations and maintenance at LGU levels. The team leader reviewed policies, standards and processes and provided overall supervision of activities.

The ABCs were technical staff members from either the Provincial Planning and Development (PPDO) or the Provincial Engineering Office (PEO) and were chosen based on their involvement with actual rural roads operations and maintenance activities. In addition, their provincial offices manage and maintain rural roads information and keep direct links with their municipal counterpart thus providing them with a ready network that can facilitate information generation. The ABCs guided the selection of the 15 municipalities and 30 barangays. The following table lists the study areas.
Table 1: The Study Areas

<table>
<thead>
<tr>
<th>Province</th>
<th>Region</th>
<th>Income Class</th>
<th>Municipality</th>
<th>Barangay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Samar</td>
<td>VIII</td>
<td>2nd</td>
<td>Maydolong</td>
<td>Seguinon</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Borongan</td>
<td>Cabalagnan</td>
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<td></td>
<td></td>
<td></td>
<td>Salcedo</td>
<td>Siha</td>
</tr>
<tr>
<td>Zamboanga Norte</td>
<td>IX</td>
<td>1st</td>
<td>M.A. Roxas</td>
<td>Iberan</td>
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<td></td>
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<td></td>
<td>Katipunan</td>
<td>Lusod</td>
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<td></td>
<td>Tampilisan</td>
<td>Malbog</td>
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<tr>
<td>Albay</td>
<td>V</td>
<td>1st</td>
<td>Sto. Domingo</td>
<td>Lipakan</td>
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<td></td>
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<td>Libon</td>
<td>Capase</td>
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<td>Camalig</td>
<td>Sebod</td>
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<td>Basagan</td>
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<td>Sanao</td>
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<td>Singatong</td>
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<tr>
<td>Guimaras</td>
<td>VI</td>
<td>4th</td>
<td>Jordan</td>
<td>Bariw</td>
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<td></td>
<td></td>
<td></td>
<td>Nueva Valencia</td>
<td>Buga</td>
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<td>Malosbolos</td>
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<td>Cotmon</td>
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<td>Comun</td>
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<td></td>
<td></td>
<td>Libod</td>
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<tr>
<td>Bataan</td>
<td>III</td>
<td>1st</td>
<td>Balanga</td>
<td>San Roque</td>
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<td>Bagac</td>
<td>Salvacion</td>
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<td>Samal</td>
<td>Calaya</td>
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</table>
1.4 Limits of the Study

The study was conducted in LGUs distributed in 3 InfRES and 2 non-InfRES provinces. The selection of the study sites was based on road density by population and area, income classification, accessibility and peace and order conditions.

As the study covered a relatively small sample size, its findings are confined to trends and/or patterns on rural roads maintenance procedures and practices that are current in the LGUs studied. The research focused on the activities and accomplishments of the period of the 2001-2004 LGU administration with regards to rural roads operations and maintenance and included a review of secondary information and field visits to selected rural roads.

The visits were conducted during the summer months of April-May 2005 when the state of rural roads before the rains was observed. The visits allowed the team to look at the results of the previous year's maintenance activities.

1.5 Structure of the Report

Chapter 2 gives an overview of the current rural roads situation in the country, deriving some basic information from the DILG report. Chapter 3 details the country's rural road maintenance framework describing the various policies, laws, standards and norms, while Chapter 4 provides descriptions of the situation in the 5 study provinces. Chapter 5 provides an assessment of current road maintenance processes, practices and capacities of local government units from secondary information as well as key informant interviews and field observations. Chapter 6 lists the results of the field visits and interactions with barangay-based key informants. Chapter 7 summarizes the research team's findings and Chapter 8 presents its recommendations.
Local roads constitute about 86% of the total road network in the country, but because of the deplorable state of most local roads, the desired development of the rural areas has been elusive. The ADB-DILG study contends that a significant factor in the current condition of the country’s rural road network relates to the absence of a clear policy on its operation and maintenance.

2.1 Road Network

The road network of the whole country has a total length of 199,685 kilometers of which 27,897 kilometers (14%) are national roads and 171,788 kilometers (86%) are under the responsibility of the various local government units. The local roads are further distributed into: 28,503 kms provincial roads; 15,816 kms municipal roads; and 121,702 kms of barangay roads. Table 2 indicates that only 14% of local roads are paved while the remaining 86% are either earth or gravel roads.

Table 2: Road Inventory, Philippines (kilometers)

<table>
<thead>
<tr>
<th>Classification</th>
<th>Paved</th>
<th>%</th>
<th>Unpaved</th>
<th>%</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>National</td>
<td>16,029</td>
<td>57</td>
<td>11,868</td>
<td>43</td>
<td>27,897</td>
</tr>
<tr>
<td>Local</td>
<td>23,287</td>
<td>14</td>
<td>148,501</td>
<td>86</td>
<td>171,788</td>
</tr>
<tr>
<td>Total</td>
<td>39,316</td>
<td>20</td>
<td>160,369</td>
<td>80</td>
<td>199,685</td>
</tr>
<tr>
<td>Local Roads</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provincial</td>
<td>5,825</td>
<td>20</td>
<td>22,678</td>
<td>80</td>
<td>28,503</td>
</tr>
<tr>
<td>City</td>
<td>4,048</td>
<td>70</td>
<td>1,719</td>
<td>30</td>
<td>5,767</td>
</tr>
<tr>
<td>Municipal</td>
<td>5,394</td>
<td>34</td>
<td>10,422</td>
<td>66</td>
<td>15,816</td>
</tr>
<tr>
<td>Barangay</td>
<td>8,020</td>
<td>7</td>
<td>113,682</td>
<td>93</td>
<td>121,702</td>
</tr>
<tr>
<td>Total</td>
<td>23,287</td>
<td>14</td>
<td>148,501</td>
<td>86</td>
<td>171,788</td>
</tr>
</tbody>
</table>
2.2 Road Density

The ADB-DILG Policy Framework Report mentions that among the ASEAN countries, the Philippines has the highest road density but the lowest in terms of paved ratio. Table 3 provides a comparative analysis of this situation among selected countries in Southeast Asia.

Table 3: Road Density Ratio and Paved Ratio of Selected Countries (reprinted from ADB-DILG)

<table>
<thead>
<tr>
<th>Country</th>
<th>Road Density (Km/Km²)</th>
<th>Paved Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philippines</td>
<td>0.67</td>
<td>0.21</td>
</tr>
<tr>
<td>Indonesia</td>
<td>0.19</td>
<td>0.47</td>
</tr>
<tr>
<td>Malaysia</td>
<td>0.20</td>
<td>0.82</td>
</tr>
<tr>
<td>Thailand</td>
<td>0.42</td>
<td>0.35</td>
</tr>
<tr>
<td>Vietnam</td>
<td>0.46</td>
<td></td>
</tr>
</tbody>
</table>

The Philippines almost exclusively favors the use of more expensive concrete for paving while Malaysia and Thailand prefer other options for their roads. Malaysia and Thailand, relatively rich states, understandably exhibit high paved ratios among the five countries.

Table 4: Estimates of Funding Situations

<table>
<thead>
<tr>
<th>Summary of Estimates</th>
<th>Amount (PhP,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimate of required expenditure on road maintenance</td>
<td>9,873,315</td>
</tr>
<tr>
<td>Estimate of current expenditure on road maintenance</td>
<td>3,086,347</td>
</tr>
<tr>
<td>Estimate of current deficit in annual road maintenance fund</td>
<td>6,786,969</td>
</tr>
<tr>
<td>Estimate of expenditure on road improvements (spread over 5 years)</td>
<td>7,999,047</td>
</tr>
<tr>
<td>Estimate of expenditure on road improvements (spread over 10 years)</td>
<td>3,997,023</td>
</tr>
<tr>
<td>Total additional annual funding requirements for road maintenance and improvement works for 5 year program</td>
<td>14,781,016</td>
</tr>
<tr>
<td>Total additional annual funding requirements for road maintenance and improvement works for 10 year program</td>
<td>10,783,992</td>
</tr>
</tbody>
</table>
2.3 Estimates of Current Annual Road Maintenance Expenditures, Deficit, and Additional Requirements for Maintenance and Improvements

The ADB-DILG Report estimated that the current road maintenance requirements amounts to an average of PhP57,474/kilometer annually. The report estimated that the current deficit in annual road maintenance is about PhP6.8 billion, while the total additional funding requirements for road maintenance and improvement for 5 and 10 year programs are PhP14 billion and PhP10.8 billion respectively.
Rural Road Maintenance Framework

Road maintenance can be defined as the "preservation of roads and bridge structures as nearly as possible to its original condition when first constructed or subsequently improved." Proper and timely maintenance of a newly constructed or rehabilitated road is the concern of LGUs and communities who benefit the most. Without maintenance, well-constructed roads are doomed to deteriorate and eventually become impassable.

Government policies that influence LGU actions on rural roads operations and maintenance are contained in the following:

Republic Act No. 917 or the "Philippine Highway Act" provided for the classification of roads as: National, Provincial, City, Municipal and Barangay roads.

Executive Order No. 113, issued in 1955 clearly defining the classification prescribed in RA 917. The following table describes the road classification and the corresponding administrative responsibility.

---

1 Roads in the Philippines 2003, DPWH, JICA
2 Operation and Maintenance Manual for Completed Infrastructure Rural Infrastructure Sub-Projects, MRDP-DA
In the light of the Local Government Code of 1991, The DPWH proposed an updated road classification scheme in April 1998, 2001 and in 2002. This classification is based on grouping roads into functional categories and the primary types of service to be provided by these roads. From September 2002 to January 2003, DPWH, DILG, consultants and representatives from Provincial, City and Municipal Engineers’ Associations reviewed the proposed road classification. The activity led to a final version of the proposed classification system. The following is the final version.

It should be noted that other agencies – Departments of Agriculture, Agrarian Reform and Environment and Natural Resources - also construct roads as part of their programmes

<table>
<thead>
<tr>
<th>Road</th>
<th>Description</th>
<th>Administrative Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>National - Arterial</td>
<td>Continuous in extent, form part of the main trunk line system; all roads</td>
<td>Design, construction, management and maintenance by national government through the Department of Public Works and Highways (DPWH)</td>
</tr>
<tr>
<td>- Secondary roads</td>
<td>leading to national ports, seaports, parks or coast-to-coast roads</td>
<td></td>
</tr>
<tr>
<td>Provincial</td>
<td>Secondary roads connecting municipalities to primary roads and each other;</td>
<td>Design, construction and maintenance under the Provincial Engineering Offices (PEOs)</td>
</tr>
<tr>
<td></td>
<td>other roads as designated by the Province through legislation</td>
<td></td>
</tr>
<tr>
<td>City</td>
<td>Major streets in the city if not provincial or national road; other roads</td>
<td>Planning, design, construction and maintenance under city engineering offices</td>
</tr>
<tr>
<td></td>
<td>designated by City through legislation</td>
<td></td>
</tr>
<tr>
<td>Municipal</td>
<td>Major streets in the municipality if not provincial or national road; other</td>
<td>Planning, design, construction and maintenance under municipal engineering offices (MEOs)</td>
</tr>
<tr>
<td></td>
<td>roads designated through local legislation</td>
<td></td>
</tr>
<tr>
<td>Barangay</td>
<td>Classified as penetration roads or FMRs connecting brgy's with each other</td>
<td>Routine maintenance by Barangay council through Barangay Road Maintenance Committee (also referred as Committee on Public Works/Infrastructure)</td>
</tr>
<tr>
<td></td>
<td>and to road network of the area; other roads designated by local council.</td>
<td></td>
</tr>
</tbody>
</table>
3.1 Road Design Standards and Manuals

The DPWH Design Guidelines Criteria and Standards for Public Works and Highways are documents still in use and referred to with regards to road construction and maintenance. These documents provide geometric standards for roads, depending on the terrain where the infrastructure is constructed, and the type of materials for embankments and/or cuttings.

The DPWH document also provides guidance in the formulation of road maintenance manuals such as the Road Maintenance Manual prepared by the DILG under the Second Rural Road Improvement Project (SRRIP) and the Mindanao Rural Development Program (MRDP) Maintenance Manual of the Department of Agriculture. However these are not accepted as being standards for the whole country.

<table>
<thead>
<tr>
<th>Road Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Roads</td>
<td></td>
</tr>
<tr>
<td>Primary arterial</td>
<td>Connect major cities</td>
</tr>
<tr>
<td>Secondary arterial</td>
<td>Connect provincial centers; cities to national primary road; major tourist service centers to national primary rd; airports and base ports to national primary rd; other cities</td>
</tr>
<tr>
<td>Tertiary arterial</td>
<td>Connect to major government infrastructure, alternative direct connections between National arterial roads</td>
</tr>
<tr>
<td>Provincial Roads</td>
<td>Connect municipalities and cities w/o passing thru national roads; connect national arterial roads to barangay roads thru rural areas</td>
</tr>
<tr>
<td>Municipal and City Roads</td>
<td>Roads within the poblacion; connect to provincial and national roads; provide inter-barangay connections to major municipal and city infrastructures w/o passing thru provincial roads</td>
</tr>
<tr>
<td>Barangay Roads</td>
<td>Other roads within the barangay not covered in above definitions</td>
</tr>
<tr>
<td>Toll Roads</td>
<td>Roads where a toll for passage is levied in an open or closed system</td>
</tr>
<tr>
<td>Expressways</td>
<td>Expressways with full control of access</td>
</tr>
</tbody>
</table>
The SRRIP Road Maintenance Manual incorporates the Road Maintenance Management System (RMMS) adopted by the then Ministry of Public Works and Highways (MPWH) and the Ministry of Local Government (MLG), developed in 1983 and later revised in 1992. The Manual was first tested in 14 SRRIP provincial units and 9 DILG regional offices covering the SRRIP provinces and a final version was produced in 1993. With the enactment of the Local Government Code and the resulting decentralization of many functions and responsibilities to LGUs, including maintenance of local roads, the “Manual is no longer issued on a mandatory basis but rather as an advisory code of practice following considerable consultation and as a supporting document to aid the further development of good road maintenance practice.”

3.2 Local Government Code

This legislation was enacted in 1991 to implement the government’s policy of decentralization. The Law provides the local government units the capacity and flexibility to plot their respective paths to development, describes in detail the LGUs’ new roles and responsibilities and provides the funds needed to achieve development.

Pertinent provisions of the Code are the following:

Section 2. Declaration of Policy

“(a) It is hereby declared the policy of the State that the territorial and political subdivisions of the State shall enjoin genuine and meaningful autonomy to enable them to attain their fullest development as self-reliant communities and more effective partners in the attainment of national goals. Towards this, the State shall provide a more responsive local government structure . . . whereby local government units shall be given more powers, authority, responsibilities, and resources. . .”

Section 3. Operative Principles of Decentralization

“(d) The vesting of duty, responsibility and accountability in local government units shall be accompanied with the provision for reasonably adequate resources to discharge their powers and effectively carry out their functions; hence, they shall have the power to create and broaden their own sources of revenue and the right to a just share in national taxes and an equitable share in the proceeds of the utilization and development of the national wealth within their respective areas.”
Rule V Article 25 states that the LGUs in addition to their existing functions and responsibilities should provide for basic services and facilities devolved from national government. The Rule prescribes that the Barangay is responsible for the maintenance of roads, bridges and water supply system within their administrative boundaries while the Municipality and the Province are responsible for the construction and maintenance of infrastructure facilities that also include roads and bridges.

Chapter 2, Sec 17 – Basic services and facilities. LGUs shall endeavor to be self-reliant and shall continue exercising the powers and discharging the duties … to efficient and effective provision of the basic services and facilities enumerated herein.

**For a barangay**
(v) maintenance of barangay roads and bridges and water supply systems;

For a municipality
(viii) Infrastructure facilities … to service the needs of the residents funded out of municipal funds … including municipal roads and bridges … (and other basic service facilities and infrastructures)

**For a province**
(vii) Infrastructure facilities … which are funded out of provincial funds … including provincial roads and bridges … (and other basic service facilities and infrastructures)

Chapter 2, Sec 18 – Power to generate and apply resources. LGUs shall have the power and authority to establish an organization that shall be responsible for the efficient and effective implementation of their development plans, programme objectives and priorities; to create their own sources of revenues; levy taxes, fees and charges, and have a share in national taxes which shall be automatically and directly released to them.

Chapter 5, Local Pre-qualification, Bids and Awards Committee. LGUs can establish their own committee to conduct pre-qualification of contractors, bidding, evaluation and recommendations for award of contracts for local infra projects.

---

Book II, Chap 2, Section 155 – Toll, Fees and Charges. LGUs may construct, operate or maintain roads, bridges, etc, either directly or by tie-up in which case they may charge toll fees or charges that boost local revenues.

Article 7, Section 477. The Code also declares that the Provincial/Municipal/City Engineers are mandated to “administer, coordinate, supervise, and control the construction, maintenance, improvement, and repair of roads, bridges, and other engineering and public works projects of the local government unit concerned” This provision clearly states that the engineering offices are the LGUs’ primary departments involved in road maintenance. However it should be noted that Barangays are not included.

3.3 Republic Act No. 9184. Government Procurement Reform Act of 2003

The new Procurement Act prescribes policies pertaining to the “procurement of infrastructure projects, goods and consulting services, regardless of source of funds, whether local or foreign, by all branches and instrumentalities of government, its departments, offices and agencies, including government-owned and/or controlled corporations and local government units...” Under this law, a procurement plan is required for all activities involving procurements.

3.4 Department Order No. 32-01. Income Bracket Reclassification of Provinces, Cities and Municipalities, Department of Finance, March 26, 1997

Income classification of LGUs is the basis for determining the financial capability to address the funding requirements of developmental projects and other priority needs of the locality. The classification is used in the preparation of project studies and proposals as a factor in the allocation of national or other financial grants. It is also used to determine the maximum amount for salaries and wages, salary scales and rates of allowances, per diems and other emoluments that local government officials and personnel are entitled to. The income classification is also used to determine the number of Sangunian (Council) members and the implementation of personnel policies on promotions, transfers, details or secondments and related matters at the local government levels. This classification is periodically adjusted by the Department of Finance. The following describes the income brackets for the classification of LGUs as of 2003.
The annual income refers to revenues and receipts realized by LGUs from regular sources of the General Fund including the internal revenue allotment and other shares provided for by law. It is exclusive of non-recurring receipts such as other national aids, grants, financial assistance, loan proceeds, sales of assets and others.

<table>
<thead>
<tr>
<th>Income Class</th>
<th>Average Annual Income (Pesos)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Provinces</strong></td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>255,000,000 or more</td>
</tr>
<tr>
<td>Second</td>
<td>170,000,000 or more but less than 255,000,000</td>
</tr>
<tr>
<td>Third</td>
<td>120,000,000 or more but less than 170,000,000</td>
</tr>
<tr>
<td>Fourth</td>
<td>70,000,000 or more but less than 120,000,000</td>
</tr>
<tr>
<td>Fifth</td>
<td>35,000,000 or more but less than 70,000,000</td>
</tr>
<tr>
<td>Sixth</td>
<td>Below 35,000,000</td>
</tr>
<tr>
<td><strong>Cities</strong></td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>205,000,000 or more</td>
</tr>
<tr>
<td>Second</td>
<td>155,000,000 or more but less than 205,000,000</td>
</tr>
<tr>
<td>Third</td>
<td>100,000,000 or more but less than 155,000,000</td>
</tr>
<tr>
<td>Fourth</td>
<td>70,000,000 or more but less than 100,000,000</td>
</tr>
<tr>
<td>Fifth</td>
<td>35,000,000 or more but less than 70,000,000</td>
</tr>
<tr>
<td>Sixth</td>
<td>Below 35,000,000</td>
</tr>
<tr>
<td><strong>Municipalities</strong></td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>35,000,000 or more</td>
</tr>
<tr>
<td>Second</td>
<td>27,000,000 or more but less than 35,000,000</td>
</tr>
<tr>
<td>Third</td>
<td>21,000,000 or more but less than 27,000,000</td>
</tr>
<tr>
<td>Fourth</td>
<td>13,000,000 or more but less than 21,000,000</td>
</tr>
<tr>
<td>Fifth</td>
<td>7,000,000 or more but less than 13,000,000</td>
</tr>
<tr>
<td>Sixth</td>
<td>Below 7,000,000</td>
</tr>
</tbody>
</table>
3.5 Revenue sources and expenditures of local government units

Table 8 summarizes the revenue sources and expenditures of LGUs during the period 2001-2003. The summary indicates that municipalities are still very much dependent upon the Internal Revenue Allotment (IRA) which comprise about 80% of its total revenues. Cities generate more local revenues with its broader tax base such that only 51% of its total income is from IRA, while some 77% of total provincial revenues still come from the annual allotment from central government.

Table 8: Summary of Income and Expenditures of Local Government Units, 2001-2003 (millions)

<table>
<thead>
<tr>
<th>LGU</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Provinces</td>
<td>Cities</td>
<td>Municipalities</td>
<td></td>
</tr>
<tr>
<td>IRA</td>
<td>25,970.64</td>
<td>24,096.18</td>
<td>36,822.15</td>
<td>43,900.04</td>
</tr>
<tr>
<td>Total revenues</td>
<td>33,240.37</td>
<td>47,676.76</td>
<td>47,113.04</td>
<td>54,860.24</td>
</tr>
<tr>
<td>Total expenditures</td>
<td>34,056.29</td>
<td>46,816.22</td>
<td>41,517.15</td>
<td>45,313.75</td>
</tr>
<tr>
<td>IRA/Total Revenues</td>
<td>78.12</td>
<td>50.54</td>
<td>78.16</td>
<td>88.69</td>
</tr>
<tr>
<td>IRA/Total expenditures</td>
<td>76.25</td>
<td>51.47</td>
<td>88.69</td>
<td>96.56</td>
</tr>
</tbody>
</table>

It can be noted that IRA comprise a large part of the total expenditures of provinces and municipalities.
The study focused on 3 InfRES and 2 non-InfRES provinces. The 3 InfRES provinces of Eastern Samar, Zamboanga del Norte, Albay and the 2 non-InfRES provinces of Guimaras and Bataan, highlighted in the map, comprise the study area.

Figure 1: Map of the Philippines indicating location of the study provinces
4.1 The Study Provinces

Eastern Samar is a second class province and one of the six that form part of the Eastern Visayas Region VIII. It is situated on the eastern coast of Samar Island, the third largest island in the Philippines, and has a total population of 375,822 distributed in 23 municipalities and 597 barangays. The province has a sparse population with a density of 84 persons per square kilometer, as against the national figure of 255 persons/km². Its road network has total length of 1,402 kilometers or a road density of 0.32 km/km².

The Province contributes to the regional economy through agricultural production, mineral resources development, agro-processing and eco-tourism.

Zamboanga del Norte is a first class province located in the northwestern tip of Mindanao in Southern Philippines. It is part of the Western Mindanao Region IX, and has an area of 7,206 square kilometers and a population of 823,130 based on the 2000 census.

The province has abundant agricultural and marine natural resources. Its 400 kilometers of coastline, 2,000 hectares of fishponds, 1,520 hectares of mangroves, freshwater swamps and marshes provide significant opportunities for aquaculture production. It is conveniently linked to major domestic markets and settlement areas.

The province is readily accessible to the expanding markets of the Brunei-Indonesia-Malaysia-Philippines East Asia Growth Area (BIMP-EAGA) through the international port of Zamboanga City, and is currently considered as an industrial enterprise zone.

The province has a network of paved and well-maintained roads and highways that stretch to over 1,000 kilometers from north to south. Asphalt paved highways interconnect the twin component cities and the 22 out of the 25 municipalities, as well as the neighboring provinces. Only one municipality remains inaccessible because of peace and order conditions.

Albay is a first class province that lies at the southern tip of Luzon. It is subdivided into 15 municipalities and 3 cities and 720 barangays with a total land area of 2,553 square kilometers. The population is 1,090,907 as of the 2002 census. The provincial population density is around 427 persons/km² with a growth rate of 1.77%.
The province is a regional administrative center where all regional government agencies, major offices and companies are located. It is a significant source of geothermal energy from 2 power plants with a combined energy generating capacity of 316 megawatts; a tourism destination both for domestic and foreign visitors for its active Mayon Volcano, pristine beaches, caves, waterfalls and springs; and, a learning and educational center being host to the only state university in the region and 33 other tertiary schools.

The province's total road network is 1,890 kilometers.

Guimaras is the youngest and smallest of the six provinces in the Western Visayas Region VI. This fourth class province lies southeast of Panay Island and northwest of Negros. The province's total land area is 60,457 hectares, 59,600 hectares of mainland and some 857 hectares of uninhabited islets. The province is composed of 5 municipalities with a population of 141,450 as of the 2000 census.

Being a tropical island ecosystem, the most dominant form of vegetation is the coconut palm with an area of approximately 15,400 hectares, followed by grassland and shrubs for a combined area of 13,700 hectares.

Bataan is a first class province that lies on the west coast of Central Luzon Region III and is a national landmark commemorating Philippine heroism and independence. The province has a total land area of about 1,373 square kilometers, 81% of which are upland hills and mountainous regions and the rest consisting of lowlands and plains. The province is composed of 11 municipalities, 1 city and 238 barangays. In the 2000 census, the total population was recorded at 557,659.

Based on December 2003 records, of the total road length, provincial roads represent 315 kilometers, municipal roads 61 kilometers and barangay roads 807 kilometers. Bataan is located near Metro Manila and is an industrialized province with a broad tax base. It is host to major industries such as the Bataan Economic Zone, Petrochemical Industrial Estate, Department of National Defense Arsenal, Orica Explosives, and Petron Bataan Refinery.
Table 9 gives an overview of the main characteristics of the 5 Provinces.

### Table 9: The Provinces Selected for the Study

<table>
<thead>
<tr>
<th>Province</th>
<th>Income Class</th>
<th>Population</th>
<th>Land Area (sq.km.)</th>
<th>Total road length (km)</th>
<th>Road Density by land area</th>
<th>Road Density per 1000 population</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. Samar*</td>
<td>Second</td>
<td>375,822</td>
<td>4,339</td>
<td>1,402</td>
<td>0.32</td>
<td>0.77</td>
</tr>
<tr>
<td>Zamboanga Norte</td>
<td>First</td>
<td>823,130</td>
<td>7,206.</td>
<td>4,129</td>
<td>0.57</td>
<td>5.02</td>
</tr>
<tr>
<td>Norte*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Albay*</td>
<td>First</td>
<td>1,090,907</td>
<td>2,552</td>
<td>437</td>
<td>0.17</td>
<td>0.40</td>
</tr>
<tr>
<td>Guimaras</td>
<td>Fourth</td>
<td>141,450</td>
<td>604</td>
<td>545</td>
<td>0.90</td>
<td>3.85</td>
</tr>
<tr>
<td>Bataan</td>
<td>First</td>
<td>557,659</td>
<td>1,373</td>
<td>1,568</td>
<td>1.14</td>
<td>2.81</td>
</tr>
</tbody>
</table>

*InfRES Provinces

### 4.2 Annual Internal Revenue Allotment (IRA), Income and Expenditures

Table 10 summarizes the actual IRA, income and expenditure patterns in the study provinces during the period 2001-2003. Zamboanga del Norte registers the highest income averaging PhP649 million for the 3-year period, while Guimaras, a relatively new province, earned an average of PhP155 million.

### Table 10: IRA, Income and Expenditures of the Study Provinces

<table>
<thead>
<tr>
<th>Province</th>
<th>Income Class</th>
<th>2001 (PhP. Millions)</th>
<th>2002 (PhP. Millions)</th>
<th>2003 (PhP. Millions)</th>
<th>Total Income (millions)</th>
<th>Total Expenditures (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zamboanga Norte</td>
<td>First</td>
<td>405.695</td>
<td>512.411</td>
<td>535.754</td>
<td>500.828</td>
<td>710.716</td>
</tr>
<tr>
<td>Albay</td>
<td>First</td>
<td>362.592</td>
<td>467.216</td>
<td>481.538</td>
<td>408.078</td>
<td>607.238</td>
</tr>
<tr>
<td>Guimaras</td>
<td>Fourth</td>
<td>127.476</td>
<td>147.853</td>
<td>155.031</td>
<td>136.291</td>
<td>155.757</td>
</tr>
<tr>
<td>Bataan</td>
<td>First</td>
<td>263.773</td>
<td>287.270</td>
<td>301.609</td>
<td>390.131</td>
<td>348.807</td>
</tr>
</tbody>
</table>
Table 11 indicates how much of the provincial total income is derived from the annual IRA of the LGUs. The two first class provinces of Zamboanga del Norte and Bataan register low percentages compared to the rest indicating the broader options for these LGUs to generate internal funds. Bataan's IRA/total income ratio during the period is about 68%, while Zamboanga del Norte stood at 75%. The rest of the study LGUs exhibits high dependence on their annual revenue allotments, consistent with the findings of the ADB-DILG Rural Roads Development Policy Framework Project Report.

Table 11: Percentage of IRA to total provincial income for the 3-year period

<table>
<thead>
<tr>
<th>Province</th>
<th>Income Class</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Samar</td>
<td>Second</td>
<td>96.61</td>
<td>97.65</td>
<td>97.43</td>
</tr>
<tr>
<td>Zamboanga Norte</td>
<td>First</td>
<td>81.00</td>
<td>72.10</td>
<td>72.97</td>
</tr>
<tr>
<td>Albay</td>
<td>First</td>
<td>88.85</td>
<td>76.94</td>
<td>87.28</td>
</tr>
<tr>
<td>Guimaras</td>
<td>Fourth</td>
<td>93.53</td>
<td>94.93</td>
<td>89.42</td>
</tr>
<tr>
<td>Bataan</td>
<td>First</td>
<td>67.61</td>
<td>82.36</td>
<td>58.77</td>
</tr>
</tbody>
</table>
4.3 Road Network Inventory

Table 12: Road Network Distribution by Province

<table>
<thead>
<tr>
<th>Province</th>
<th>Land Area sq. km</th>
<th>Population 2000</th>
<th>Total Road Network (km)</th>
<th>National (km)</th>
<th>%</th>
<th>Prov'l (km)</th>
<th>%</th>
<th>Mun (km)</th>
<th>%</th>
<th>Barangay (km)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Samar</td>
<td>4,339.700</td>
<td>375,822</td>
<td>1,402</td>
<td>311</td>
<td>22</td>
<td>236</td>
<td>17</td>
<td>168.</td>
<td>12</td>
<td>685</td>
<td>49</td>
</tr>
<tr>
<td>Zamboanga N.</td>
<td>6,618.100</td>
<td>823,130</td>
<td>4,129</td>
<td>395</td>
<td>10</td>
<td>802</td>
<td>19</td>
<td>444</td>
<td>11</td>
<td>2,486</td>
<td>60</td>
</tr>
<tr>
<td>Albay</td>
<td>2,552.600</td>
<td>1,090,907</td>
<td>1,861</td>
<td>398</td>
<td>21</td>
<td>443</td>
<td>24</td>
<td>115</td>
<td>6</td>
<td>908</td>
<td>49</td>
</tr>
<tr>
<td>Guimaras</td>
<td>604.457</td>
<td>141,450</td>
<td>545</td>
<td>124</td>
<td>23</td>
<td>130</td>
<td>24</td>
<td>24</td>
<td>5</td>
<td>265</td>
<td>49</td>
</tr>
<tr>
<td>Bataan</td>
<td>1,373.000</td>
<td>557,659</td>
<td>1,535</td>
<td>350</td>
<td>23</td>
<td>315</td>
<td>21</td>
<td>61</td>
<td>4</td>
<td>807</td>
<td>53</td>
</tr>
<tr>
<td>Total</td>
<td>2,988,968</td>
<td>9,474</td>
<td>1,580</td>
<td>17</td>
<td></td>
<td>1,888</td>
<td>20</td>
<td>814</td>
<td>9</td>
<td>5,154</td>
<td>54</td>
</tr>
</tbody>
</table>

The total length of national roads comprises some 17%, provincial roads 20%, municipal roads 9%, while barangay roads constitute 54%. This confirms that most roads in the rural areas are either a barangay road or a provincial road. Municipal roads, mostly in the town centre, consist of low maintenance concrete and/or asphalt roads. Most barangay roads are either gravel or earth.

The distribution of roads in the study municipalities is in the following Table 13.
Table 13: Municipal Road Distribution Summary

<table>
<thead>
<tr>
<th>Province (income class)</th>
<th>Municipality</th>
<th>Population</th>
<th>Land Area (Sq. km)</th>
<th>Total Road Network</th>
<th>Nat'l kms</th>
<th>%</th>
<th>Prov'l kms</th>
<th>%</th>
<th>Mun kms</th>
<th>%</th>
<th>Brngy kms</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Samar (second)</td>
<td>Borongan</td>
<td>55,141</td>
<td>586</td>
<td>230</td>
<td>28</td>
<td>12</td>
<td>30</td>
<td>15</td>
<td>16</td>
<td>7</td>
<td>154</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>Salcedo</td>
<td>16,971</td>
<td>113</td>
<td>253</td>
<td>19</td>
<td>7.5</td>
<td>38</td>
<td>15</td>
<td>4</td>
<td>2</td>
<td>192</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td>Maydolong</td>
<td>11,741</td>
<td>413</td>
<td>46</td>
<td>10</td>
<td>22</td>
<td>22</td>
<td>5</td>
<td>12</td>
<td>30</td>
<td>16</td>
<td>36</td>
</tr>
<tr>
<td>Zamboanga Norte (first)</td>
<td>M.A. Roxas</td>
<td>33,659</td>
<td>281</td>
<td></td>
<td>24</td>
<td>44</td>
<td>182</td>
<td>5</td>
<td>32</td>
<td>88</td>
<td>113</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>Katipunan</td>
<td>37,448</td>
<td>244</td>
<td></td>
<td>27</td>
<td>27</td>
<td>24</td>
<td>5</td>
<td>32</td>
<td>88</td>
<td>113</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>Tampilisan</td>
<td>19,536</td>
<td>111</td>
<td></td>
<td>27</td>
<td>27</td>
<td>24</td>
<td>5</td>
<td>32</td>
<td>88</td>
<td>113</td>
<td>53</td>
</tr>
<tr>
<td>Albay (first)</td>
<td>Sto. Domingo</td>
<td>27,392</td>
<td>7</td>
<td>57</td>
<td>14</td>
<td>24</td>
<td>34</td>
<td>19</td>
<td>36</td>
<td>8</td>
<td>10</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>Libon</td>
<td>66,213</td>
<td>227</td>
<td>157</td>
<td>67</td>
<td>43.1</td>
<td>37</td>
<td>36</td>
<td>36</td>
<td>8</td>
<td>10</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>Camalig</td>
<td>58,141</td>
<td>130</td>
<td>103</td>
<td>14</td>
<td>14</td>
<td>30</td>
<td>12</td>
<td>36</td>
<td>8</td>
<td>10</td>
<td>33</td>
</tr>
<tr>
<td>Guimaras (fourth)</td>
<td>Jordan</td>
<td>28,745</td>
<td>126</td>
<td>137</td>
<td>27</td>
<td>39</td>
<td>1</td>
<td>6</td>
<td>10</td>
<td>99</td>
<td>99</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td>N. Valencia</td>
<td>34,225</td>
<td>137</td>
<td>137</td>
<td>27</td>
<td>39</td>
<td>1</td>
<td>6</td>
<td>10</td>
<td>99</td>
<td>99</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td>Sibunag</td>
<td>16,565</td>
<td>120</td>
<td></td>
<td>27</td>
<td>39</td>
<td>1</td>
<td>6</td>
<td>10</td>
<td>99</td>
<td>99</td>
<td>99</td>
</tr>
<tr>
<td>Bataan (first)</td>
<td>Balanga</td>
<td>71,088</td>
<td>111</td>
<td>110</td>
<td>16</td>
<td>15</td>
<td>44</td>
<td>41</td>
<td>5</td>
<td>5</td>
<td>43</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Bagac</td>
<td>22,353</td>
<td>231</td>
<td>155</td>
<td>23</td>
<td>15</td>
<td>13</td>
<td>9</td>
<td>3</td>
<td>2</td>
<td>115</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>Samal</td>
<td>27,410</td>
<td>56</td>
<td>108</td>
<td>32</td>
<td>30</td>
<td>17</td>
<td>16</td>
<td>3</td>
<td>3</td>
<td>51</td>
<td>51</td>
</tr>
</tbody>
</table>

Table 13, although incomplete, still indicates that barangay roads are the most numerous transport infrastructures at local level. The lengths of national roads in the study municipalities in Zamboanga del Norte and in 2 municipalities in Guimaras are not indicated in the Table for lack of available data in the LGUs' inventory.

The roads that need maintenance in the rural areas, provincial and barangay, comprise about 73% of the total with a major part of the responsibility being with the LGUs with the least in resources and technical capacity.

The data on Barangay roads cannot be guaranteed with any level of confidence.
Overall management of a province is the responsibility of elected officials that include the Governor, Vice Governor and members of the local legislative body Sanguniang Panlalawigan (SP). The Vice Governor presides over the SP composed of the elected regular members, the presidents of the provincial chapter of the League of Barangay, the provincial federation of municipal Sanguniang Bayan (SB) members of municipalities and sectoral representatives.

The provincial government is mandated to prepare a comprehensive multi-sectoral development plan. This action is initiated by the Provincial Development Council (PDC) and approved by the SP. The Council is responsible for setting the direction of the province’s social and economic development and in coordinating all subsequent development efforts within the territory. This setup is mirrored at municipal level with the equivalent Sanguniang Bayan (SB) and Municipal Development Council (MDC) performing functions provided by law and similar to the higher level LGU counterpart but limited within its boundaries and capacity.

The barangay serves as the primary planning and implementing unit of government policies, plans, programs, projects, and activities in the community. The barangay government is composed of a punong barangay as the chief executive, 7 sanggunian barangay members, the sanggunian kabataan chairperson, a barangay secretary and a barangay treasurer. The legislative body of a barangay is known as the Sanggunian Barangay. It is chaired by the Punong Barangay, has seven regular members and with the Sanggunian Kabataan chairman as ex-officio member.

Under these provincial and municipal government organizations are offices tasked to implement the approved sectoral plans. For infrastructures, the provincial and municipal engineering offices are responsible for its development, management and operation.
5.1 Organizations tasked to do rural road maintenance

Rural roads operations and maintenance are the responsibility of engineering offices at all LGU levels. Depending on the size, resources and leadership of the local government unit, the engineering offices vary in terms of organization, manpower complement and extent of responsibilities. In some of the provinces studied, the engineering office gets a budget allocation that is bigger than the annual budget of a municipality, while some mention that they still depend upon the Department of Public Works and Highways (DPWH), a national agency that decentralized its functions and responsibilities, to help in road construction and maintenance work.

5.1.1 Provincial Engineering Office

The Provincial Engineering Office (PEO), under the office of the Governor, is tasked to oversee the care and maintenance of all provincial roads, bridges and other provincial infrastructures such as buildings and facilities, water supply system, school buildings, barangay facilities, parks and playgrounds and others. Originally confined to maintenance of existing facilities, the PEO in some areas have assumed broad roles in materials and quality testing, planning, programming, implementation, improvement of existing infrastructures and development and operation of the equipment pool to meet the growing needs of the province. Its prescribed responsibilities include the following:

- Rural road maintenance planning
- Maintenance plan adoption and approval
- Integration into Annual Investment Plan
- Bidding and awarding of contracts
- Management and supervision of maintenance activities
- Setting standards and costs norms
- Monitoring and evaluation
- Hiring of maintenance crew

The task of road maintenance management in the province is the responsibility of the PEO’s Maintenance Division. A Maintenance Engineer heads this with clerical support provided by the Administrative Division. In most provinces, a Maintenance Foreman or Capataz, who works with teams of men and heavy equipment in performing maintenance of roads and bridges, assists the Maintenance Engineer.

Prescribed maintenance management activities for the Division are the following:
Formulate annual work programs and budgets;
Consolidate maintenance work reports prepared and submitted by field personnel;
Evaluate standards for maintenance performance, including work methods and procedures and criteria for maintenance planning;
Update the inventory of the provincial roads and bridges.
Provide the Provincial Engineer with information on road maintenance activities and requirements.

A typical Provincial Engineering Office has the following organizational setup.
Figure 2: Provincial Engineering Office Structure
The Maintenance Engineer (ME) executes the road and bridge maintenance program of the province. The ME is assisted by a General Foreman in providing the direction, supervision and monitoring of maintenance activities. For maintenance works, the Maintenance Division performs the following typical tasks:

✧ Identify needed maintenance works;
✧ Organize and staff work forces in accordance with workload requirements;
✧ Recommend to the Provincial Engineer specific periodic maintenance and betterment works; and
✧ Monitor work performance and provide guidance and assistance to improve work methods and maintenance crew performance.

5.1.2 Municipal Engineering Office

The operation and maintenance of municipal roads is the responsibility of the Municipal Engineering Office (MEO). It is primarily tasked to do the following:

✧ Initiate, review and recommend changes in policies and objectives, plans and programs, techniques, procedures and practices in infrastructure, public works in general of the local government unit concerned;
✧ Advise the Mayor on infrastructure, public works and other engineering matters;
✧ Administer, coordinate, supervise and control the construction, maintenance, improvement, and repair of roads, bridges, and other engineering and public works projects;
✧ Provide engineering services to the local government unit concerned, including investigation and survey, engineering designs, feasibility studies and project management.

In some municipalities with the capacity to maintain and operate a relatively complete organization, a Municipal Engineer, an Assistant Municipal Engineer, a Senior Engineer, a number of Junior Engineers, an Architect, a Construction and Maintenance General Foreman and several Construction and Maintenance Men (CMM) would comprise this office. Like the PEO, the MEO also covers monitoring and evaluation of construction activities of other infrastructures in the municipality, such as markets, boat landing facilities, residential and/or school buildings.
In relatively small municipalities, the Municipal Engineering Office is in sharp contrast to its provincial counterpart PEO. In these municipalities, the MEO is a one-person entity and the direction, supervision and monitoring of road maintenance work is performed by the Municipal Engineer himself, not to mention the time devoted to other infrastructure construction and operation. Casuals hired on an as needed basis such as a labor foreman, laborers, plumbers, drivers, etc, provide assistance to the ME. The MEO occasionally assists the Municipal Planning and Development Office (MPDO) on development activities that require engineering inputs like detailed engineering design of roads and bridges and the evaluation of building structural designs for clearance purposes.

In municipalities that own and operate heavy equipment, the Engineer is also responsible for its operations and management. A heavy equipment mechanic and a few heavy equipment operators engaged on a contractual basis normally assist the ME.

In most municipalities, the construction and maintenance personnel including the equipment crew, attend to routine and periodic maintenance work only as the need arises. This is so considering the very limited number of municipal roads under its responsibility, some totaling just under a kilometer of roads and located within the town’s urban area, such that no maintenance plan to outline future activities is prepared.

5.1.3 Barangay

The Punong Barangay, as the Chief Executive of the Barangay Government, performs law-mandated duties and functions aimed primarily to protect the interest and uphold the general welfare of the barangay and its inhabitants. The Barangay Chairman can enter into and sign contracts on behalf of the barangay, solicit funds, materials and voluntary labor for specific barangay public works and cooperative enterprises from the residents, landowners, producers and merchants in the barangay.

The barangay is tasked to prepare a comprehensive multisectoral development plan. This is initiated by the Barangay Development Council (BDC) and approved by the Sanggunian Barangay (SB). Assisting the SB in setting and coordinating economic and social development of the territory is the Barangay Development Council (BDC). It is headed by the Punong Barangay and is composed of SB members, a representative of the Congressmen and representatives of NGOs operating in the barangay, the latter constituting not less than one-fourth of the members of the fully organized council. The BDC has the following functions:
Mobilize people participation in local development efforts
Prepare barangay development plans based on local requirements, and
Monitor and evaluate the implementation of national and/or local programs and projects

The Barangays are at the forefront of development activities and bear the brunt of rural roads maintenance responsibilities as they are not only mandated to do so but also receive annual budget allocations for the purpose. The Barangay does not have an engineering office to look after barangay roads but has the Committee on Public Works and Infrastructure as the focal unit on barangay roads operations and maintenance. With very limited resources and technical capacity, most barangays seek the assistance of the higher level LGU and/or local and national legislators to attend to the operations and maintenance of its transport infrastructures that comprise about 50% of all roads in the province.

As with other local government units, barangays are obliged to set aside 20% of their annual Internal Revenue Allotment (IRA) for development projects. Depending on how the barangay perceive the need for road maintenance, the 20% is spent subject to the discretion of its development council and leadership.

Barangay ordinances can be enacted to provide for the construction and maintenance of barangay facilities and other public works projects chargeable to their general fund or other funds available for the purpose. Such funds may include grants-in-aid, subsidies, contributions, and revenues from national, provincial, municipal funds, and from other private agencies and individuals, all understood to accrue to the barangay as trust fund.

The Barangay can also solicit or accept, public works and cooperative enterprises from national, provincial, municipal agencies for financial, technical, and advisory assistance, on the condition that the Barangay will not commit any amount of money that is more than what is currently available in the barangay treasury that is not earmarked for other purposes. The Barangay can also hold fund raising activities for barangay projects without securing permits from any national or local agencies. The proceeds from these activities are tax-exempt and accrue to the general fund of the barangay.

The Barangay can also enact resolutions to provide compensation, reasonable allowances, per diems or travel expenses for barangay members and other officials, subject to the budgetary limitations prescribed by law.
The Barangay Committees relevant to barangay roads operations and maintenance are the following:

- **Committee on Finance, Budget, and Appropriation.**
  All matters relative to the budget; local taxes fees and charges; loan and other sources of local revenues; annual and supplemental budgets; appropriation ordinances; all matters related to local taxation and fiscal administration; Sanggunian internal rules and violation thereof; order of business and calendar business; disorderly conduct of members and investigation thereof; privileges of members.

- **Committee on Public Works/Infrastructure.**
  All matters relative to planning, construction, maintenance, and improvement of public buildings, repair of roads, bridges, and other government infrastructure projects; measures that pertain to drainage and sewerage systems and similar projects.

- **Committee on Environmental Protection/Public Utilities.**
  All matters relative to environmental protection and natural resources; measures affecting the environment; operation/establishment of all kinds of public utilities including but not limited to, transport and communication system.

5.2 **Budget**

The budget for rural roads operations and maintenance come from 2 main sources. These are the General Fund and the 20% of the Internal Revenue Allotment (IRA) or the Development Fund. In addition, The LGU can also generate funds through local taxes and fees, permits and clearances, borrowings, sales of assets, national government aid and subsidies.

Additional sources of development funds, although external in nature and not as regular and as reliable compared with the above-stated sources, are the Philippine Development Assistance Fund (formerly Countrywide Development Fund) of Congressmen and Senators and the Social Fund of the Office of the President. The elected officials exercise control of their respective funds and decide on its use and distribution, most of which are spent on infrastructures in areas of their choice.

As LGU funds for infrastructure development, operations and maintenance are never enough, establishing a strong and effective network with the officials responsible for investing the PDAF and SF budget becomes a necessity for local leaders.
5.2.1 General fund

All local government units are mandated to maintain a General Fund “to account for such monies and resources that may be received by and disbursed from the local treasury.” The Fund consists of resources of the LGU that are available to pay for expenditures and obligations not covered by any other funds. The General Fund comes from collections on real estate tax, business tax, borrowings, grants and aid, sales of properties, etc.

Under the General Fund, the LGU maintains special accounts for:

✧ Public utilities and other economic enterprises
✧ Loans, interests, bond issues, and other contributions for specific purposes, and
✧ Development projects funded from the share of the LGU in the internal revenue allotment and other accounts that may be created by law or ordinance

The Fund also comes from profits or net income derived from the operation of public utilities and other economic enterprises, after payment of repairs, improvement costs and other related expenses. Some provinces include subsidy income, borrowings and surplus revenue. Unspent budget commitment from previous year constitutes LGU savings and forms part of the General Fund.

General expenditures covered by the General Fund consist of:

✧ Personnel services
✧ Maintenance and other operating expenses
✧ Non-office expenditure
✧ Capital outlay

In practice, some provinces allocate resources for road operations and maintenance under the budget items Roads, Highways and Bridges – Repair and Maintenance or as payment for wages of workers under the Maintenance, Operations and Other Expenses (MOOE).

\[8\] Sec. 308. Local Funds. Local Government Code of 1991 (RA 7160)
Most LGUs use the MOOE to maintain operations of facilities such as repairs or payment of bills in using streetlights, water supply systems communication facilities, etc. N.P. throughout the LGUs, personnel services are the largest single expenditure of the General Fund.

5.2.2 Internal Revenue Allotment

All local government units receive a share in the national internal revenues taxes in the form of the annual Internal Revenue Allotment (IRA). The IRA distribution is: Provinces 23%; Cities 23%; Municipalities 34%, and Barangays 20%.

The share of each province, city and municipality is determined based on: Population 50%; Land area 25%; and Equal sharing 25%. The IRA is released directly to each LGU within 5 days from the end of each quarter. An example of revenue/expenditure report indicating IRA and other available funds is in the following Table 14.

Table 14: Revenue and Expenditures, 2001-2003, Bataan

<table>
<thead>
<tr>
<th>Particulars</th>
<th>2002 (Actual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Beginning Balance (Unappropriated Surplus)</td>
<td>8,097,989.17</td>
</tr>
<tr>
<td>2. Total Income</td>
<td></td>
</tr>
<tr>
<td>2.1 IRA</td>
<td>348,807,205.09</td>
</tr>
<tr>
<td>2.2 Operating and Miscellaneous Revenue</td>
<td>308,508,417.43</td>
</tr>
<tr>
<td>Extra-Ordinary Receipts</td>
<td>76,124,887.52</td>
</tr>
<tr>
<td>Borrowings</td>
<td></td>
</tr>
<tr>
<td>Capital Revenue</td>
<td></td>
</tr>
<tr>
<td>Grant and Aid</td>
<td></td>
</tr>
<tr>
<td>Surplus Adjustment</td>
<td>(35,826,099.86)</td>
</tr>
<tr>
<td>3. Net Available for Appropriations</td>
<td>356,905,194.26</td>
</tr>
<tr>
<td>4. Total Expenditures</td>
<td></td>
</tr>
<tr>
<td>4.1 Personnel Services</td>
<td>330,817,452.69</td>
</tr>
<tr>
<td>4.2 Maintenance and other Operating expenses</td>
<td>225,723,369.86</td>
</tr>
<tr>
<td>4.3 Non-office Expenditure</td>
<td>105,094,082.83</td>
</tr>
<tr>
<td>4.4 Capital Outlay</td>
<td></td>
</tr>
<tr>
<td>5. Unappropriated Balance</td>
<td>26,087,741.57</td>
</tr>
</tbody>
</table>
Bataan is in fact not as dependent on IRA as the other provinces. The percentage of IRA to total income is about 68.09% for the 3-year period, compared to other provinces with dependency ratio that range between 87-97%.

5.2.3 The Philippine Development Assistance Fund (PDAF, formerly Countrywide Development Fund or CDF)

This is the budget appropriated for and disbursed by Congressmen and Senators as their direct development assistance to their constituents. The budget is channeled through the agencies mandated to undertake activities identified by the legislators. For instance, a Congressman’s support for road improvement in a pre-identified area is channeled through the DPWH; funding support for health services in a specific municipality that gets the legislator’s approval is done through the Department of Health or Department of Social Welfare and Development; or funds for the construction of additional classrooms sponsored by a Senator or Congressman can be coursed through the DPWH also or directly to the LGU. Similar to their local elected officials, legislators prefer to put the money into highly visible infrastructure projects.

5.2.4 Other Sources of Funds for the Local Government Unit

Other sources of LGU income include Tax Revenues, General Income Accounts, Subsidy Income, Borrowings, Capital Revenues and Grant and Aid. Actual sources of income are summarized in Table 15.

Table 15: Other Sources of Income

<table>
<thead>
<tr>
<th>Sources of Income</th>
<th>Income Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Tax Revenues</td>
<td>Amusement Tax, Business Tax, franchise Tax, Occupation Tax, Printing and Publication Tax, Property Transfer Tax, Real Property Tax, tax on sand, Gravel &amp; Other Quarry Products, Fines and Penalties</td>
</tr>
<tr>
<td>2. Operating and Miscellaneous Revenues</td>
<td>Permit Fees, Clearance and Certification Fees, Medical, dental and Laboratory Fees, Hospital Fees, Rental Fees, Income from Grants and Donations, Interest Income, Internal Revenue Allotment, Miscellaneous Operating and Service Income, Other income from Hospital Operations,</td>
</tr>
<tr>
<td>3. Subsidy Income</td>
<td>Subsidy from SEF</td>
</tr>
<tr>
<td>4. Borrowings</td>
<td>Loans from Banks (LBP)</td>
</tr>
<tr>
<td>5. Capital Revenue</td>
<td>Sales of Fixed Assets</td>
</tr>
<tr>
<td>6. Grant and Aid</td>
<td>Aid from National Government</td>
</tr>
</tbody>
</table>
5.3 Maintenance Activities

5.3.1 Mapping

Most provinces have maps of their respective territories, although prepared in different formats, scale and through different methods. Some provinces have their maps in GIS, others do them manually, while some scan the 1:50,000 topographic maps issued by the National Mapping and Resource Information Authority (NAMRIA) and manipulate these using their computers.

An example from Guimaras of the maps used is shown below:

**Figure 3: Map of Guimaras, GIS Format, PPDO**

In Guimaras Province, maps are still drawn manually to a scale of 1:50,000 reflecting major infrastructure and political boundaries. Recently, the provincial government initiated the implementation of a GIS-based tax mapping system both at the provincial and municipal levels, which includes production of maps based on aerial photographs, and property maps based on individual land parcels.
Albay is making use of the topographic maps from NAMRIA and has assigned some of its technical staff to update the information on these maps.

Bataan has no standard mapping system in place. For several years, the province relied on the Department of Public Works and Highways (DPWH) in the mapping of roads. The road map maintained and used by Provincial Engineering Office (PEO) and Provincial Planning and Development Office (PPDO) is based on the 1990 provincial road map provided by DPWH. The PEO Maintenance Division is preparing an updated provincial road map. The Division is now conducting a physical inventory and ocular inspection of all provincial roads to update and/or validate the existing road inventory and eventually produce a provincial road map on a 1:50,000 scale.

Eastern Samar recently purchased the ArcInfo computer program to upgrade the province’s mapping capacity. The distributor of the software will train a number of technical staff from the concerned provincial offices.

In most municipalities, the Municipal Planning and Development Office (MPDO) prepare maps as part of the Comprehensive Land Use Plan (CLUP) formulation, like the map of Salcedo, Eastern Samar. The draftsmen draw these maps manually on a 1:25,000 scale. The maps, although mostly lifted from the NAMRIA topographic maps, do not indicate accurately all road sections within the municipality. Many municipalities have no municipal road map but instead make use of report-size barangay maps prepared by the Municipal Engineering Office.

Barangays are obliged to maintain the socio-economic information about their areas. This information includes maps that are displayed in Barangay offices to reflect basic information such as roads, clustering of households, location of basic service facilities and health indicators. These maps are rudimentary, not necessarily updated and even at such a scale, cannot be considered as accurate reflection of actual conditions. Most of these maps were prepared in compliance with the program under the Social Reform Agenda – Minimum Basic Needs (SRA-MBN) of the national government sometime in the early ‘90s.
5.3.2 Rural Roads Inventory

The inventory of all roads in the country used to be the responsibility of the Department of Public Works and Highways (DPWH). When government decentralized, the DPWH turned over the relevant documents to the concerned LGUs and focused only on the operation and maintenance of national roads. Most LGUs adopted the DPWH inventory and updated the documents using resources at their disposal. Such an inventory should provide information in the name of each road, its length, the type, the type of pavement surfacing and by whom it is maintained.

Some provinces maintain a more comprehensive inventory with information regarding surface conditions and current status. Some provincial road inventories indicate use of surface materials that include concrete, asphalt, gravel and earth.

5.3.3 Current Roads Condition Survey

In the course of supervision of road projects implemented and managed by the designated engineers, the officials are familiarized with the road conditions. In addition, the engineers receive reports about the actual physical conditions of the rural roads, whether provincial or barangay, from the maintenance foremen, barangay officials and community leaders. The field reports are regarded as the road condition survey, which may be reinforced by information from barangay officials and community leaders that are contained in barangay resolutions officially requesting assistance on the maintenance and repair of barangay roads. These reports and resolutions are submitted to the PEO who then classifies the needed activities as to routine or periodic maintenance, or repair, betterment and improvement works. Prioritization and rough estimates of costs are then done. Before July of each year, a list of road sections for maintenance or repair is made and checked with the reports of the PEO division or unit that deals with survey and investigation and/or internal control and monitoring.

Clearly these ad-hoc systems of condition depending on the subjective judgment of a variety of actors is likely to produce an unrealistic assessment of the condition of the roads.

5.3.4 Maintenance Planning

Provincial Level

Most of the PEOs in the study areas do not prepare a Road Maintenance Plan. However, the PEO’s Maintenance Division conducts periodic ocular
inspections of road and bridges to identify maintenance needs and prepares the appropriate program of works and cost estimates. Instead of the Maintenance Plan, a Procurement Plan is submitted to comply with the new Government Procurement Act of 2003, a law that standardizes and regulates government purchase of materials and payment of services. The accomplished document is presented to the Provincial Engineer for approval and consideration in the Annual Investment Plan (AIP) and to secure funding.

It can be noted that what is included in these documents as far as road maintenance is concerned are allocations for road repair works, activities that should be distinguished from routine and/or periodic maintenance.

The following table outlines the typical maintenance planning activities performed by staff of the Provincial Engineering Office.

Table 16: Maintenance Activities

<table>
<thead>
<tr>
<th>Activity/ies</th>
<th>Staff Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Inventory</td>
<td>Maintenance Engineer</td>
</tr>
<tr>
<td></td>
<td>Maintenance Foreman</td>
</tr>
<tr>
<td>Current road condition survey</td>
<td>Maintenance Foreman</td>
</tr>
<tr>
<td></td>
<td>Crew</td>
</tr>
<tr>
<td>Determination of road maintenance requirements</td>
<td>Maintenance Engineer</td>
</tr>
<tr>
<td>Maintenance Costs Estimation</td>
<td>Work scheduling and implementation</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Review and Corrections</td>
</tr>
<tr>
<td>Identification of Maintenance priorities</td>
<td>Province Engineer</td>
</tr>
<tr>
<td>Plan adoption and approval</td>
<td></td>
</tr>
</tbody>
</table>

Table 16 confirms that maintenance activities as seen by the LGUs are repair works in reaction to the damage done on the road. Preventive maintenance should be part of the above-listed activities.

The process of infrastructure development, management and maintenance starts with the Provincial Finance Committee convening the various department heads of the province. The PEO is consulted on funding requirements for the departments’ infrastructure concerns and matched with the available amount in the General Fund. After the total income and revenues have been matched with the estimated budget, the Annual Budget for the General Fund is submitted to the Governor. A budget hearing is called by the Chief Executive for the department heads to defend their
respective budget requirements. After due deliberations and successful defense by the concerned parties, the Chief Executive approves the Executive Budget for submission to the Sangunian.

The PEO also receives requests from barangays for assistance on the maintenance of roads in their respective areas. These requests come in the form of Barangay Resolutions prepared and passed by the Barangay Development Council. These requests when accepted and approved are also integrated into the provincial Annual Investment Plan (AIP), taking about six months to accomplish. Once integrated into the AIP and endorsed to the provincial legislative body Sanguniang Panlalawigan, funds can be allocated under the budget line Infrastructure and project category Roads and Bridges. However, inclusion in the AIP, and with the corresponding budget allocation, is not a firm outright assurance of project implementation. This is because implementation of infrastructure projects still depends upon the Local Chief Executive’s order of priorities.

Municipal

Owing to the minimal length of municipal roads, the Municipal Engineer does not prepare maintenance plans but instead, maintenance work is done as a reaction to circumstances. In some municipalities, the construction and maintenance personnel, including the heavy equipment crew if available, are not assigned to do specific road sections but perform routine and periodic maintenance work only when needed.

Barangay

In terms of total length, barangay roads constitute around 50% of all roads in a province. Ideally, road maintenance is the residents’ concern as they deal with its condition on a daily basis. However, the lack of maintenance brought about by limited financial and technical resources, render most barangay roads in deplorable conditions.

Not all barangays treat their roads similarly. Some barangays allocate specific amounts for the annual maintenance needs of their barangay roads while other barangays feel programs like health and water supply should be given priority.

In most barangays, officials conduct ocular inspection during the fourth quarter in anticipation of the release of their share of the Internal Revenue Allotment (IRA) for the coming year. The Barangay Kagawad (Council Member) who chairs the Infrastructure Committee proposes priority road
sections to be maintained and/or repaired. Considering their limited technical capability, there is no planning or mapping systems used. Instead, a certain amount is proposed for barangay road maintenance, in the same manner that the other sectors also get their respective shares. In cases where the barangay identifies a priority road section that needs substantial improvement or repair, like installation of cross drains or drifts, the assistance of the municipal or provincial governments through their respective engineering offices is proposed. Assistance sought normally would be: provision of construction materials, like cement and culverts, and technical supervision. In some cases, an Engineer or Foreman may prepare a program of works.

In instances when it is decided that the maintenance of a barangay road would require outside help, such as the use of the province or municipal heavy equipment and/or technical assistance from the MEO or PEO, a budget is allocated to cover rental and fuel costs. The appropriate barangay resolution is enacted to formalize a request.

The system used at Provincial and Barangay level does not assume any recurrent maintenance. It is based on the concept that only a road that has fallen into disrepair requires maintenance. Indeed most maintenance activities are budgeted as one off sub projects not as a recurrent item to be carried out every year.
5.3.5 Typical Maintenance Activities

Rural road maintenance activities are described in the following:

**Box 1: Rural Road Maintenance Activities**

**Routine Maintenance Operations** - required continuously.
- *non-pavement related*: required continually on all roads in maintainable condition (good and fair) during the year irrespective of traffic volume or engineering characteristics. Activities include: grass cutting, bush cutting, drain clearing, ditch cleaning, culvert cleaning, road sign cleaning, repairs of minor damage to side slopes, levelling of shoulders and verges.
- *pavement related*: required at intervals during the year with a frequency depending on condition of the pavement and traffic volume/composition. Activities include: for paved roads, repairing pot-holes, patching, for unpaved roads, repairing pot-holes.

**Periodic Maintenance Operations** - required at intervals of several years.
- *for paved roads*: resealing, regravelling of shoulders, line marking.
- *for unpaved roads*: regravelling or replacement of unbound macadam pavements.

**Emergency Maintenance Operations** - required to deal with emergencies where immediate action(s) is required to ensure road user safety.
- Activities include removal of debris/obstacles, clearing of land slides, repairs to localized damages road sections/structures.

**Routine maintenance**

These are work activities to be performed by maintenance crews every year on every road to prevent and/or arrest deterioration. Prevention of deterioration is the fundamental element of maintenance as it aims to preserve the road in a reasonable state. Ideally, this activity should be supervised by a maintenance engineer and performed by the LGU’s Construction and Maintenance Capataz (CMC) and crew on a cyclical basis.

However, this activity is perceived differently by LGUs. Consider the following:
In the study areas, what is referred to by LGU officials as routine maintenance is actually repair of the road and cannot be considered as a preventive activity. In addition, the frequency of this activity – as the need arises – is a reactive action and should be distinguished from the annual activity as described in the box above.

**Periodic Maintenance**

More extensive work on a larger scale than routine maintenance characterizes periodic maintenance. The purpose of this action is to try to put a stop to deterioration and restore roads and bridges as close as possible to their original condition. This type of maintenance is more expensive and requires proper planning. Based on the recommendation of the Engineers regarding how they perceive road conditions, activities are recommended and are submitted to the PEO’s planning section.

Periodic maintenance is also not a one off activity but one which should be planned and budgeted for. The periodicity will vary but it should be understood that it will take place over the life of the road.

**Emergency works**

This consists of urgent repairs to paved and/or unpaved roads to make them safe for users, like removal of fallen trees, debris, dropped off and/or abandoned vehicles and unauthorized structures. These do not include damages due to natural disasters that may necessitate extensive works. The objective of emergency work activities is primarily to reduce disruption on the use of the affected road section and normalize the flow of motor vehicles.

Emergency works is obviously done when the need arises. Considering that timeliness is a must, the regular CMMs are pooled to the affected area to hasten completion of work. In some cases, the community extends assistance through bayanihan or self-help initiatives.

The most common rural road maintenance work activities done by the province that uses heavy equipment and/or manual labor are summarized in the following table:
5.3.6 Cost Estimation

For provincial roads, the PEO conducts ocular inspection and prepares a program of work and cost estimates based on prevailing cost of materials, current prices of services and heavy equipment. The work program indicates the required maintenance activities such as resurfacing, drainage, reshaping, repair of shoulders and vegetation control.

For municipal roads, and considering that there is no maintenance plan, the municipal government simply allocates a minimal amount intended for the operating expenditures of heavy equipment such as fuel, oil and lubricants. As the need arises, and if additional funding is available, a program of work may be prepared for a specific road section by the Construction Foreman and reviewed by the Municipal Engineer. For instance, gravel roads may get an allocation of P6,000 per kilometer while concrete roads get an allocation of P2,000 per kilometer to cover costs of fuel, oil, lubricants and operator’s wages.

In Guimaras, current wage rates prevailing at the provincial and municipal levels are P150 for laborers and P200 for skilled workers (mason, carpenters). At the barangay level the rate ranges from P100 to P120 for laborers and P175 for skilled workers. These rates are below the minimum wage but workers have to be contented with such rates. Presently, the Sangguniang Panlalawigan is in the process of reviewing the current rates to make the adjustments in view of the increased cost of living brought about by the continuous increases in fuel costs.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Utilize Heavy Equipment</th>
<th>Utilize Manual Labour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetation Control</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Cleaning and reshaping of ditches</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Patching Potholes and depressions</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Erosion Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleaning of culverts and other structures</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Reshaping of Road Surface</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Hauling of materials</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Resurfacing/regraveling</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Clearing of fallen trees and debris</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Shoulder repair/restoration</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Tree planting</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Table 17: Common Maintenance Activities
As stated earlier, both provincial and municipal engineering offices do not prepare maintenance plans. Hence, cost estimation normally involves computing the cost of materials needed such as resurfacing materials, cement, reinforced concrete pipes and fuel, oil and lubricants. Based on records, cost of resurfacing materials is P250 for a 6 cu.m. truck, reinforced concrete pipes cost P1,300/piece, and fuel, oils, lubricants are based on prevailing prices. Estimation involves computing the volume or quantity needed based on field assessment on where repairs are to done and does not involve cost norms indicating cost of maintenance on a per kilometer basis.

In Bataan, labor cost ranges from 180/day to 500/day depending on the position and the work to be done. Equipment usually consist of a Road Grader (P6,500/day), Road Roller (5,000/day) and Water Truck (P2,850/day). Materials such as selected borrow cuts costs P180/cu.m while base coarse costs P350/cu.m.

In Albay, cost estimation of maintenance work for budgeting purposes adopts the Effective Maintenance per Kilometer (EMK) rate of PhP56,000/kilometer. For actual cost estimation, the PEO uses the prevailing market price of materials and services plus a 10% mark-up to cover price escalation. In some instances, the PEO makes use of prevailing DPWH rates.

In Zamboanga, no individual program of work is prepared for each road section where routine maintenance is to be undertaken. Expenses are just charged to the lump sum amount for the Maintenance of 2nd Class Roads and Bridges under the General Fund. This is because the routine maintenance is done on a cyclical basis and based on the actual needs of the road sections. The entire lump sum amount is programmed at 50% for equipment rental, including fuel and oil, 30% for direct labor and 20% for materials. It has to be mentioned that the LGU owns and operates a fleet of heavy equipment.

For periodic maintenance and repair/betterment/improvement of rural roads, individual Program of Works (POWs) are prepared describing the scope and extent of work to be undertaken (items of work and corresponding quantities per item of work) for specific road sections. Cost per item of work is based on equipment rental rate, cost of direct labor, materials and Engineering Supervision and Administrative and Overhead Expenses (ESAO). There is no provision for 15-30% contractor's profit because the projects are done by force account with PEO as implementer.

At municipal level, the LGU also observes the same procedures. The basis of their cost estimation for direct labor is dependent upon the income class of the municipality. A 4th class municipality would have PhP100-150 per day for labor, while a first class province would have P265 a day. The rental
rates of equipment are also based on the capacity and performance. Materials cost, like sand and gravel, is dependent on the hauling distance from the source to the project site.

At barangay level, the local government implements only routine maintenance on their roads under the supervision of barangay officials themselves. The MEO provides, occasionally, technical assistance while accounting services are undertaken at the municipal accounting office.

In areas where equipment cost does not include rental rates but only fuel costs, key informants stated that actual use of the equipment is subject to the personal priorities of the operator, resulting in less working hours and/or poor quality delivery.

5.3.7 Budgeting

Every year, the Provincial Engineering Office proposes a road maintenance budget for funding under the General Fund. Because of budget limitations, the Finance Committee of some provinces first determines all Maintenance, Operations and Other Expenses (MOOE) requirements for the year and if available funds are not sufficient to meet the proposed budget, the PEO is just given an amount to work with. Hence, not all proposed maintenance activities are funded every year. Prioritization is done to allocate funds to road sections perceived to require more work. Only annual routine maintenance is carried out with no additional budget allocated for emergency maintenance. Should emergency work be needed, funds are taken from the regular maintenance fund.

Budget preparation starts with the Provincial/Municipal Treasurer’s Office issuing a financial statement of estimated income for the year, basically establishing funds available for budgeting. Every July 15, the Provincial/Municipal Budget Officer issues a budget call for all departments to submit budget proposals for consolidation by the LGU Budget Office.

A budget hearing is then called by the Local Chief Executive (LCE) to deliberate on the proposals in consideration of the total available resources (income). The appropriation level is determined to establish how much increase should be made from the previous year’s budget based on available resources for the current year. Once the draft budget is determined, concerned departments make corrections to finalize their office’s budgets. Every 16th of October, the draft budget is submitted to the Sangguniang Panlalawigan, or the Sangguniang Bayan (SB) for municipalities, for authorization and the enactment of the appropriation ordinance. The provincial budget is later submitted to the Department of Budget and Management (DBM) for review, the municipal budget to the Provincial
Budget Office and the barangay budget to the Municipal Budget Office. Should there be discrepancies, payments made out of the current budget are stopped for corrections based on the findings of the reviewing office like the DBM and the Provincial/Municipal Budget Offices. Once implementation starts, the Commission on Audit performs its mandate in assuring that disbursements are in accordance with the approved appropriation ordinance.

In reality, a big factor to consider on the funding, approval and implementation of roads maintenance projects whether identified by the PEO or requested by the barangays and integrated in the Annual Investment Plan, is the discretionary privilege of the Local Chief Executive. In areas where the LCE and the SB dislike each other, infrastructure development projects are in most instances sidelined by this strained relationship between the executive and legislative branches of government.

5.3.8 Annual Investment Planning

The Annual Investment Plan consolidates the various departments’ prioritized and approved investment proposals and indicates how the LGU’s estimated income will be distributed for the year. The AIP provides a brief description of the Programs, the implementation schedule and an estimate of the funds needed by quarter.
Adoption of the AIP for the year requires the enactment of the LGU resolution signed by the members of the concerned local legislative body.

In the approved AIP of Bataan Province for 2001, under Infrastructure - Roads and Bridges, out of the 48 items listed, 42 are for concreting/asphalting/construction of 25 rural and 17 urban barangay roads, 1 gravelling, and the rest repair of wooden and steel bridges. Except for the lone gravelling of one road, there is no mention of other road maintenance activities. Similar patterns of budget allocation are repeated in the AIPs of 2002-2004.

It can be seen that for LGUs, maintenance means repair, specifically concreting. It is also interesting to note that in the 2003 Certified Statement of Income and Expenditures for the municipality of Samal in Bataan, PhP200,000 were spent on repair/maintenance of roads and bridges in 2002, none under actual expenditure for the first quarter of 2003 and still none under estimated expenditure for the second quarter. This is an affirmation that inclusion in the AIP is not an assurance that the project or activity will get funding and be implemented.

It should be noted that funds for roads whether for rehabilitation or maintenance can come from a variety of budget lines and may indeed be hidden within such budgets. It is therefore extremely difficult to assess what funds have been allocated let alone what has been spent.

In Guimaras, only the 2001 AIP mentions 5 road-related entries allocating PhP2.5 million for concreting of four 5-meter wide road sections of totaling 819 linear meters. The AIPs of 2002-2003 do not include road-related entries.

In Zamboanga, in the approved Concept Paper scheme, providing the PEO the mandate to engage in infrastructure development contracts, the province was doing 10 projects related with road operations and maintenance. The list indicates activities on the roads as construction, rehabilitation, improvement or concreting.

The AIPs and the Certified Statements of Income and Expenditures of the LGUs clearly indicate that routine maintenance is seldom done and/or is not recognized to warrant a budget allocation in the LGU plans and programs. Routine maintenance is mostly done at barangay level to clear the way for the entry of a road grader to work on the roadway and the side drains, as required by the LGU engineer responsible for the deployment of the heavy equipment.
5.3.9 Implementation

Generally, provincial road maintenance activities are managed and supervised by the PEO. This is usually done by administration or force account as the province feels it is cost efficient because these are carried out by regular employees thereby minimizing or even eliminating some indirect costs such as the 15-30% contractor’s profit. A combination of labor-intensive and labor-based equipment supported methods are utilized in implementing maintenance work. Engineering Assistants supported by Maintenance Foremen conduct field supervision. The Maintenance Engineer monitors the work supervision.

In a large province such as Zamboanga del Norte, Mobile Maintenance Teams are created by the PEO for each Area Field Office to undertake routine maintenance. The Team is composed of a Maintenance Capataz and a group of laborers. They are mobilized when and where their services are needed. Other than the urgent/instant assignments, the teams also conduct routine maintenance in their assigned road sections. Under the direction of the Area Engineers, the capataz also supervises the heavy equipment fleet activities. Most of the capataz are licensed civil engineers and have the capability to direct and supervise engineering works.

For periodic maintenance and other road projects, a Project Engineer is assigned to each individual project. Contractual workers are hired by the Chief Executive based on the approved POW, co-terminus with the project and supervised by the Area Engineer under the direct supervision of the Project In-charge. The contractual workers are hired locally, mostly upon the recommendation of the Barangay Captain in the area.

A similar procedure on a smaller scale is practiced in some of the municipalities of the study areas. At the barangay level, the barangay captain, subject to the comptrollership of the Municipal Accountant’s Office, implements projects funded from the barangay IRA.

Key informants declared that delays caused by bureaucratic processes, especially concerning release of payments, happen at all levels. This contributes to the laborers’ preference for other livelihood options, when available, over a local government roadwork endeavor.

In Eastern Samar, for better management of maintenance activities, the Maintenance Division has two management units each headed by a General Maintenance Foreman. The North Unit is responsible for maintaining provincial roads and bridges in the North District of the province composed of 11 municipalities, while the South Unit assumes responsibility for the province’s south district of 12 municipalities.
The Maintenance Engineer prepares the work schedule and assignment of maintenance crew with the assistance of the two General Maintenance Foremen and approval of the Provincial Engineer. However, in the absence of a Maintenance Plan/Program, which clearly specifies the kinds of works, quantities of works, and resources requirements, work scheduling and assignment of maintenance has been largely done on the basis of where the maintenance crew resides as can be seen in the current assignment of maintenance personnel.

The North Unit maintains a total of 18 provincial roads with a total length of 56.458 kilometers and 120 linear meters of bridges representing 19% of the total length of provincial bridges. Assigned to this Unit are two foremen, 11 capataz, and 40 CMM.

The roads in the South Unit, on the other hand, number 32 and have a total length of 181 kilometers, which account for 76 percent of the total length of provincial roads, while bridges' length total 520 linear meters (81%). Assigned to maintain the roads under this Unit are 3 foremen, 12 capataz, and 24 CMM.

On the average, a CMM assigned to the North Unit is responsible for maintaining 1.7 kilometers of provincial roads against the South’s 7.5 km per CMM. This apparent imbalance in the assignment of crew responsibilities is a result of the current policy that the maintenance personnel live in the general vicinity of the provincial roads.

It is not difficult to see the mismatch between the current staffing pattern and the workload of each management unit.

The province engaged the services of 619 casuals who worked on the average for 45 days during the period 2001, 2002, and 2004 (data for 2003 could not be found). These casuals were supposed to assist the regular CMM personnel in maintaining the province’s road network as their wages were charged against the annual maintenance funds of the province. Of this number, only 63% were assigned to provincial roads while 32.2% were detailed to various offices of both the national and provincial governments. The rest were assigned to municipal government offices, particularly the Office of the Mayor, and schools.

Generally, contract management arrangements with public contractors adopt the provisions of RA 9184 Procurement Reform Act for civil works. Private contractors submit their technical and financial proposals, which are then evaluated by the Bids and Awards Committee (BAC) and a contract is awarded to the highest-rated bidder. Contract agreements stipulate the
period of work completion and the responsibilities and liabilities of the contractor. A 10% mobilization fund is provided to the contractor at the start of work and the remaining contract amount is either paid through progress billing or upon the completion of work.

**The LGU Engineering Office as Contractor**

Decentralization and local autonomy provides the local government units with a variety of options on generation and mobilization of local revenues. The Local Government Code provides the legal basis for local government offices to engage in activities “not purely for income-generating purposes but to recover in part the costs entailed in the operations, maintenance and sustainability of government functions”\(^9\). The Code thus provides for the PEO of Zamboanga del Norte, or any similar office with the capacity, to enter into contracts and in doing actual construction and/or road maintenance works. The main objective in engaging in such activity and generate additional revenues is to “wean away from too much dependence on the Internal Revenue Allotment (IRA).”

As Zamboanga del Norte developed the capability to undertake infrastructure projects, the local administration entered into Memoranda of Agreement (MOAs) to undertake a number of DPWH-funded projects in the province. Other agencies collaborating with the DPWH then released their respective allocations to the province for their infrastructure requirements. The province also entered into a MOA with the government of Belgium for the implementation of their infrastructure projects in the LGU. Almost all infrastructure projects undertaken by the province are done by the PEO under force account using the Contract Payment System (CPS).

As contractor, the technical manpower and equipment resources of the province are entrusted under the PEO’s disposal.

In CPS, an amount is allocated in the annual budget of the General Fund for the implementation of the projects. All cost estimates indicated in the Program of Work (POW) are charged against this fund. The project implementor, which is the PEO, bills the entire cost per approved POW. Just like private contractors, the PEO submits progress reports authenticated by

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\(^9\) Concept Paper on the Contract Payment System (CPS) Scheme, Local Finance Committee, Zamboanga del Norte, 2002
the Provincial Inspectorate Team for approval by the Governor to support<br>the charges billed against the Trust Fund maintained specifically for the<br>activity.

The implementation of the CPS in Zamboanga del Norte started in 2001<br>after the Sangguniang Panlalawigan approved the program capitalization<br>fund of P185 million for the implementation of projects with which the<br>province has firm commitments with national agencies and/or donor<br>countries. At the end of the year, with the PEO as the contractor, the<br>province realized an income of P16.7 million, replenishing the General<br>Fund from which the indirect costs were charged. The Sangguniang<br>Panlalawigan, with the recommendation of the Provincial Finance<br>Committee (PFC) and supported by a Provincial Ordinance citing pertinent<br>provisions of the Local Government Code and the Procurement Act,<br>authorized the CPS scheme.

Force account by CPS is preferred to optimize the use of available funds.<br>The province not only derives income from the equipment rental but also<br>provides higher wages for contractual workers who receive P265.45 per day<br>compared to the P100.00 given by the private contractors to unskilled<br>laborers. In addition, CPS does away with the contractor’s profit. The<br>scheme is considered to be more effective from that undertaken by private<br>contractors because the province has a fleet of reliable and well-maintained<br>heavy equipment.

It should be noted however that under the CPS, the Province is Client,<br>Engineer and Contractor.

Similarly, in other LGUs with heavy construction equipment, the PEO and<br>MEO rent out their fleet to contractors, or even to other LGUs for their<br>construction and/or maintenance needs. Some municipalities borrow from<br>the Land Bank of the Philippines to purchase heavy equipment and use<br>these to generate revenues and cover part of amortization costs.

The Department of Public Work and Highways is also doing roads<br>maintenance operation for the LGUs. Although its primary responsibility is<br>the operation and maintenance of national roads using its annual<br>appropriations, the DPWH also extends assistance to the provincial, city and<br>municipal government units in doing rural roads maintenance and<br>operation. In most cases, the DPWH obliges the requesting LGUs to cover<br>expenditures like fuel, lubricants, labor costs, materials and sometimes<br>including engineering supervision. Key informants stated that the DPWH<br>also rely on sub-contractors to do the tasks.
The DPWH is also requested to do road construction, rehabilitation and/or maintenance using resources out of the Philippine Development Assistance Fund (PDAF) of Congressmen and Senators. Although the actual amounts do not pass the hands of the legislators, a budget is appropriated for a specific purpose to the DPWH. The projects are mostly done upon the initiative of the legislators and often independent of LGU plans and programs, especially in areas where the legislator is not in good terms with the local chief executive. Legislators often declare that they use part of their PDAF in response to requests from their constituents particularly on local infrastructure development.

**Other Maintenance Schemes**

The LGUs also engage Pakyaw Contractors to do the work. Under this scheme, the contractor is paid for specific components or activities. Most of these groups come from the provincial pool of accredited contractors who are invited to bid for the road maintenance work.

With the enactment of the Procurement Law of 2003, the LGUs are now obligated to avail of outside services through public bidding. Only qualified and accredited contractors are allowed to offer their services and bid for infrastructure projects or supply materials and goods.
5.3.10 Monitoring

At provincial level, the Maintenance Foreman supervises the day-to-day maintenance work of laborers and maintenance men. For heavy equipment operations on barangay roads, the equipment operator from the LGU Engineering Office providing the assistance is tasked by the LGU Engineer to do the work in coordination with concerned barangay officials. In most instances, supervision by the LGU technical staff over the assigned task seldom happens due to office workload. Instead, a signed certification of the completion of work by the concerned LGU Engineer based on documents submitted by the barangay (with attached pictures of work accomplishment if no actual site visit was done by the engineering staff) would be enough for the Municipal Treasurer to release the appropriate payment. This practice leads to absence of actual supervision during the roadwork and allows the foreman to just inspect the accomplishment and submit a report to the LGU Engineer.

Key informants stated that the concerned LGU technical staff would inspect the accomplished work depending on the availability of a service vehicle. Considering the length of roads involved and the lack of logistical support, Maintenance Foremen cannot effectively monitor field activities. Laborers are thus left to do the work with minimal supervision and timekeeping. This often leads to reduced work hours and unsatisfactory results. In some road sections visited, vegetation control is not undertaken on the entire road length and cross drains and drainage are not maintained. According to one municipal engineer, they are aware that their absence during field operations results in unauthorized heavy equipment use such as in instances when operators are requested by private individuals to grade portions of their property to open driveways or even level farm lots in preparation for planting.

Most of the time at the barangay level, it is only the heavy equipment operator that performs the work under the supervision of Barangay officials, primarily by the Barangay Captain. It was expressed during the barangay consultations that technical assistance from the Municipal Engineer’s Office is needed to help in barangay road works and ensure that the delivery complies with technical standards and norms.

Owing to the absence of maintenance standards, the quality of work is mainly based on the general appearance of the road section and its relative “passability”. This is practically the same at the municipal level. At the barangay level, once the road has been cleared of roadside vegetation and perceived to be passable, it is considered acceptable. Often the main concern is riding quality as in almost all barangay roads, resurfacing materials are
just dropped by dump trucks and spread by road graders without road rollers to compact and flatten the usually large-sized aggregates. The presence of huge aggregates in the resurfacing material results in poor riding experience and even poses safety hazards, considering that the common form of transport on barangay roads is the motorcycle.

5.3.11 Review of Past Maintenance Activities

Most provincial governments in undertaking maintenance work do it by administration or force account. Engineering Assistants and laborers are hired on casual basis and assigned to specific road sections at a daily rate ranging from PhP175-200 per day, thus providing employment to local residents.

At the barangay level, maintenance activities start after the rainy season. Laborers living in the barangay are hired to undertake clearing and general cleaning of priority road sections. After inspection by an engineer from the MEO/PEO to ascertain completion of initial work by the barangay, a grader is sent to reshape the carriageway, re-surface the low portions using materials from the roadside and re-establish the side drainage. The operation lasts for 3-5 days depending on the availability of funds. According to key informants, barangays use their budget to provide meals and other incentives for the heavy equipment operator.

Provincial roads involve relatively more enhanced activities with the use of other heavy equipment such as road rollers, and if needed, bulldozers and loaders.

Use of the Private Sector:

Pakyaw/Takay System

Under the Pakyaw/Takay System, some 10-20 barangay residents form a Pakyaw group. Headed by a leader selected by the members, Pakyaw Groups submit applications for projects not exceeding P50,000, expressing their respective bid prices for the required services. The group with the lowest bid price is awarded the contract provided the group meets all the requirements. The Leader represents the Pakyaw group in all transactions related to the work, from the signing of the contract agreement to the collection of payments based on the accomplishments.
Before 2001, the Barangay-Based/Labor-Intensive Maintenance System (BB/LIMS) was used in the Rural Infrastructure Development Program (RIDP), an ADB-funded project executed by the Department of Agriculture (DA) and implemented in selected provinces and municipalities. Under the BB/LIMS, rural road routine maintenance was implemented by the barangay with Pakyaw/Takay System. Barangay people living in the vicinity of the road section where routine maintenance was to be undertaken were hired. The barangay provided its self-generated funds while the RIDP provided hand tools for routine maintenance by manual method to the Pakyaw team. Although the system was successfully implemented, it was not sustained as barangay officials in some areas were replaced and the hand tools outlived their serviceable life span. The experience indicates that the successful implementation of the BB/LIMS depended upon the resourcefulness and initiative of Barangay Officials. The work also involved the use of some heavy equipment.

Also prior to 2001, the Upland Access Projects (UAP), funded by USAID and executed by DILG, also utilized the Pakyaw/Takay System for the construction and maintenance of minor roads. Hand tools were also issued to the barangay Pakyaw Groups. Activities continued for one year using maintenance funds provided by the project. Even after funds ran out, the system was continued and replicated in other municipalities for the routine maintenance of some of their rural roads. Additional funds were allocated from the General Fund. However, delays in the collection of payment due to long bureaucratic processes caused resentment among the daily wage earners who needed cash for their day-to-day subsistence. The workers opted to work on the farm, especially during the rainy season, just as when routine maintenance on rural roads was most needed.

The same system was also applied in the ENR-SECAL Projects funded by USAID and executed by DENR. Some barangays still implement the Pakyaw/Takay System for maintenance work after natural calamities.

**Lengthman System**

The Lengthman System for routine maintenance under the Pakyaw System was also practiced on some provincial road sections. In this system, the workers with regular appointments as Construction/Maintenance Men or Camineros were assigned to a certain length of provincial road. Working on their own pace within assigned areas, these workers were not given their salaries unless the Provincial Inspectorate Team certified that the roads were indeed well-maintained.
Training Programs and Materials

Most technical staff of the Provincial Engineering Office do not have adequate training on road maintenance. In municipalities that are recipients of foreign-assisted roads projects, key technical personnel of the Municipal Engineering Office are invited to attend a seminar on the operation and maintenance for rural access organized by the agency and funding institution, like the Department of Agrarian Reform – Asian Development Bank (DAR-ADB) for the Agrarian Reform Community Development Program (ARCDP) or the Department of Agriculture-ADB (DA-ADB) for the Infrastructure for Rural Productivity Enhancement Sector (InfRES) Project.

5.4 Rural Roads Maintenance Investment Patterns in the Study LGUs

The local government units vary not only in their capacity to generate additional income but also on how they utilize the 20% of the Internal Revenue Allotment (IRA) for development programs and projects. The Local Government Code mandates that at least 20 percent of the Internal Revenue Allotment be used for development programs and projects of the local government. The programs and projects are generally classified as Social Development, Economic Development, and Other Programs/Projects.

The following describes how some of the study LGUs generate additional income, how they invest the annual IRA, and how much went to rural roads maintenance.

5.4.1 Zamboanga del Norte Province

In Zamboanga del Norte, the Provincial Local Government Unit (PLGU) provides separate funding for Routine Maintenance (RM), Periodic Maintenance (PM) and Rehabilitation, Betterment and Improvement of Rural Roads (RBI) as follows:

✧ Routine Maintenance (RM) is funded under the General Fund as Maintenance of 2nd Class Roads and Bridges. It is appropriated a lump sum amount based on an average maintenance cost of P100,000 per km, for the entire length of provincial roads, without specifically identifying the road section to be maintained.
✧ Periodic Maintenance (PM) is appropriated a specific amount for each road section that needs PM, from either the 20% development fund (DF) or national or foreign-assisted programs
Rehabilitation, Betterment and Improvement (RBI) activities are also funded from 20% DF and other non-local funds.

Table 18, the Annual Budget of the PEO, shows that the maintenance needs of 763 kms of provincial roads is addressed by the increasing maintenance appropriation of PhP 30 M in 2001, PhP 55 M in 2002, to PhP 65 M in 2003 and PhP75 M in 2004. This amount is programmed for equipment rental, including fuel and oil at 50%, labor at 30% and materials at 20%. Routine maintenance is funded under the General Fund as Maintenance of 2nd Class Roads and Bridges.

Table 18: Section of the PEO Annual Budget for Operations and Maintenance of Roads and Bridges (millions) General Fund only, Zamboanga del Norte

<table>
<thead>
<tr>
<th>Object of Expenditures</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel Services</td>
<td>56</td>
<td>58</td>
<td>58</td>
<td>58</td>
</tr>
<tr>
<td>Maintenance of 2nd class roads and bridges</td>
<td>30</td>
<td>55</td>
<td>65</td>
<td>75</td>
</tr>
<tr>
<td>Contracting services (CPS)</td>
<td>110</td>
<td>60</td>
<td>60</td>
<td>75</td>
</tr>
<tr>
<td>Total Budget</td>
<td>288</td>
<td>247</td>
<td>278</td>
<td>361</td>
</tr>
</tbody>
</table>

Periodic maintenance and rehabilitation/betterment/improvement of roads, including major barangay roads are also funded under the 20% development fund (DF) of the IRA. On the average, the Infrastructure Sector gets 50% of the DF. The projects are equitably distributed to the municipalities and component cities and used not only for road maintenance.

5.4.2 Guimaras

Guimaras has a different experience with regards to resources allocated for road maintenance.

At provincial level, the annual maintenance budget has been fixed at P3,000,000 for the last 3 years. This budget comes from the province’s General Fund and is barely 2% of the total IRA allotment for the year. This happened because it is a policy of the present administration to devote the 20% development fund for developmental projects only and not for road maintenance activities. As such, only road construction or paving can be charged from of this fund.

On the other hand, the municipality of Sibunag in Guimaras allocates P500,000 to maintain a 7-kilometer road section that was recently converted into a municipal road. The Municipality of Jordan allocates only P50,000.
for road maintenance and this basically only covers fuel, oil and lubricant of heavy equipment. However, a budget amounting to P650,000 has been allocated for the maintenance of heavy equipment and service vehicle as a form of assistance to barangays that use the equipment. The municipality of Nueva Valencia did not allocate any road maintenance budget for the last 5 years and relies on the barangays within its jurisdiction to maintain barangay roads.

At barangay level, funds for road maintenance vary according to the current priorities of the barangay. Usually, maintenance funds range between 15% to 30% of the 20% development fund. Figures can be as low as 8% and the highest was noted in 1 barangay in Jordan at 70% of the development fund. During interactions with barangay officials, the importance of maintaining barangay roads was recognized but it was clear that maintenance has to compete with other priorities such as livelihood assistance and social services. The key informants emphasized that barangay officials are also politicians and must deliver projects based on the expressed needs of residents, or the electorate.

Current spending on maintenance is basically dependent on how much can be appropriated by the LGUs concerned. It was learned through interviews with provincial and municipal engineering personnel that demands are not adequately met but maintenance spending is only within the budget allocated for the year. In the case of the province, the annual maintenance budget is even used to cover the costs of dump truck tires and spare parts of heavy equipment. Considering that only routine maintenance is being undertaken, it is expected that maintenance needs will be higher in the coming years unless road improvement or upgrading of priority roads is implemented. At the Barangay level, future demands can even be higher considering that in most road sections, only reshaping is being done with no resurfacing that results in a significant lowering of the road carriageway.

5.4.3 Bataan

In Bataan, the 20% Development Fund of the province is allocated for Road and Bridges projects under the Infrastructure Sector, to be used for either construction or maintenance. From the General Fund, under the expenditure item Road, Highways and Bridges, allocations for Repair and Maintenance is provided.

The distribution of the 20% EDF is indicated in the following table. The share of the infrastructure sector steadily rose from 62.02% of the 20% EDF in 2001 to 75.04% in 2004. The General Fund provides additional allocation from which maintenance expenditures can be charged, such as amounts
needed for road maintenance operations under the expenditure item Road, Highways and Bridges. Road maintenance operation in the province has two ready sources, either through the 20% EDF or through the General Fund.

Table 19: 20% Development Fund Distribution, Province of Bataan

<table>
<thead>
<tr>
<th>Category/Sector</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Non-Infrastructure</td>
<td>15,071,000</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>45,319,000</td>
</tr>
<tr>
<td>Total 20% Devt Fund</td>
<td>60,390,000</td>
</tr>
<tr>
<td>% of Infrastructure to Total 20% Development Fund</td>
<td>75%</td>
</tr>
<tr>
<td>Roads &amp; Bridges</td>
<td>12,623,000</td>
</tr>
<tr>
<td>% to Total Infrastructure</td>
<td>28%</td>
</tr>
<tr>
<td>% to Total 20% Development Fund</td>
<td>21%</td>
</tr>
</tbody>
</table>

Source: PPDO, Annual Investment Plan Municipalities

Barangays do not allocate an amount for rural road maintenance operations but rather integrate common maintenance activities such as vegetation, tree planting and cleaning of ditches to the clean and green or beautification projects initiatives.

5.4.4 Eastern Samar

Eastern Samar's road network has a total length of 1,402 kilometers. The national road network, which falls under the administrative jurisdiction of the DPWH, is 311 kilometers or 22 percent of the total road length, runs through the major settlements and links Eastern Samar to other provinces. The local roads, total 1,091 kilometers or 78 percent.

Provincial roads total 237 kilometers (17%). Municipal roads account for 168 kms or 12% while barangay roads cover 686 kms (49%). Paved provincial roads, mainly funded by national government agencies like the DPWH, NIA, the Department of Agriculture, and the Department of Agrarian Reform under its foreign-assisted Agrarian Reform Community Project, total 44 kms and account for 19%. Gravel and earth surface types represent 62% and 16%, respectively.

The unpaved provincial roads are in poor condition mainly because of inadequate maintenance resulting from a lack of a systematic maintenance program. Low maintenance budget, lack of equipment, defective crew assignment, and lack of trained technical personnel characterize the province’s maintenance program. Some 83 kilometers of these roads representing 35 percent of the provincial roads are no longer maintainable.
and would require costly rehabilitation to restore the roads to a maintainable condition.

5.4.4.1 Borongan Municipality

Borongan is a second class municipality with an average annual income of P65,336,552 for the period 2001 - 2004. The municipality’s income for the period consisted of IRA of about P49,776,804 average and local revenues of P15,559,748. The IRA contributed 76.2% while local revenues covered 24% - the highest proportion of local revenue among the province's 23 municipalities.

Table 20: Municipal Income for the Period 2001 - 2004, Municipality of Borongan

<table>
<thead>
<tr>
<th>Year</th>
<th>Internal Revenue Allotment</th>
<th>Local Source</th>
<th>Total</th>
<th>% IRA</th>
<th>% Local Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>42,900,404</td>
<td>10,823,075</td>
<td>P53,723,479</td>
<td>79.8</td>
<td>20.2</td>
</tr>
<tr>
<td>2002</td>
<td>51,188,535</td>
<td>8,931,814</td>
<td>60,120,349</td>
<td>85.0</td>
<td>15.0</td>
</tr>
<tr>
<td>2003</td>
<td>51,162,276</td>
<td>20,380,103</td>
<td>71,542,379</td>
<td>71.5</td>
<td>28.5</td>
</tr>
<tr>
<td>2004</td>
<td>53,856,000</td>
<td>22,104,000</td>
<td>75,960,000</td>
<td>71.0</td>
<td>29.0</td>
</tr>
<tr>
<td>Average</td>
<td>49,776,804</td>
<td>P15,559,749</td>
<td>65,336,553</td>
<td>76.2</td>
<td>23.8</td>
</tr>
</tbody>
</table>

Source: Municipal Budget Office and Municipal Treasurer’s Office

For the same period, total expenditures of the municipality reached P69,785,057. Personal services accounted for 61.1%; maintenance and other operating expenses averaged 11.6%; capital outlay, 0.26%; development fund’s share was 14.9% and other expenses accounted for 12.1%. It can noticed that the municipality’s average expenditures is higher than the average income by about P4.4 million.

Table 22: Distribution of 20% Development Fund, Municipality of Borongan

<table>
<thead>
<tr>
<th>Item</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>% Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Development</td>
<td>P1,325,000</td>
<td>1,070,000</td>
<td>4,499,719</td>
<td>5,213,989</td>
<td>29</td>
</tr>
<tr>
<td>Economic Development</td>
<td>1,250,000</td>
<td>2,965,400</td>
<td>393,000</td>
<td>2,225,000</td>
<td>16</td>
</tr>
<tr>
<td>Other Development</td>
<td>7,894,457</td>
<td>6,295,000</td>
<td>5,339,136</td>
<td>3,308,625</td>
<td>55</td>
</tr>
<tr>
<td>Programs/Projects</td>
<td>Total Allocation</td>
<td>10,469,457</td>
<td>10,330,400</td>
<td>10,231,855</td>
<td>10,747,614</td>
</tr>
</tbody>
</table>

Source: Municipal Planning and Development Office
The municipality is a recipient of foreign-funded projects. It is currently implementing the World Bank-funded Community-Based Resource Management Project (CBRMP) with sub-projects like agro-forestry, livelihood intervention, and rural infrastructure. It is also a recipient of PREMIUMED the proceeds of which were used to construct the Borongan Public Market. Borongan has also applied for InFres assistance which it intends to use for the construction and/or rehabilitation of farm-to-market roads.

The Development Fund is allocated to three sectors, viz:

Social Development. Under this component, most of the programs/projects that are funded are for health, education, culture and arts, and sports-related activities. Funds allocated for the sector during the period 2001 – 2004 averaged P3,027,177 accounting for 29% of the total development allocation.

Economic Development. Programs and projects include agricultural development, livestock, environmental protection, tourism development, and trade and industry. Average expenditures during the period was P1,708,350, or about 3% of the average total development fund.

Other Development Programs/Projects. Major programs and projects are infrastructure development that includes maintenance of roads and bridges, maintenance of buildings and equipment, barangay development program, and other expenses that do not fall under social or economic development. The average expenditures during the same period for this component reached P5,709,304 and this accounts for the biggest share of the development fund at 55%.

| Table 23: Income & Expenditures, IRA, 20% DF, 2001 - 2003  (in million pesos) |
|-----------------|-----------------|-----------------|-----------------|
| ITEM            | 2001            | 2002            | 2003            |
| IRA             | 362,591,558.13  | 467,215,755.81  | 481,537,841.00  |
| INCOME          | 408,078,286.54  | 607,238,182.35  | 551,719,033.97  |
| EXPENDITURES    | 462,714,058.01  | 582,030,493.97  | 577,780,338.82  |
| 20% Devt Fund   | 91,047,636.40   | 89,471,495.60   | 90,190,503.40   |

The local roads in Borongan are mostly short farm-to-market roads that connect one or two barangays to a main road. Some barangay roads actually function as roads while some have deteriorated into unmaintained trails.

Almost all the barangay roads are in very bad condition but still passable
with great difficulty during the rainy season. This indicates that these roads receive very limited resources for regular maintenance.

5.4.4.2 Salcedo Municipality

For the period 2001–2004, the municipality generated an average income of P21,790,483 annually. This consisted largely of the IRA which averaged P19,852,670 per year equivalent to 90% of the total income. Local income generated largely from business and real property taxes averaged P1,937,813 or a mere 10% of the total income. Salcedo is a fifth class municipality.

Salcedo relies on its 20% development fund for development programs and projects. During the same period, the municipality spent an average of P4,070,016 per year.

Under Programs and Projects, infrastructure development got the highest share. During the four-year period, investments averaged P2,397,982 or 59% of the total development fund allocation. Economic development allocation was P1,019,534 and accounted for 25% while social development’s share was 16%.

During the entire four-year period, a negligible P20,946 was allocated in 2002 for the maintenance of municipal roads. What appeared as road maintenance-related allocation were small amounts ranging from P20 thousand to P30 thousand for “improvement” of barangay roads.

5.4.5 Albay

The Province of Albay has a total road length of 1,890 kilometers. National roads total 39 kilometers; provincial 46 kilometers; municipal 115 and barangay roads, 908 kilometers.

Table 21: Municipal Expenditures for the Period 2001 - 2004, Municipality of Borongan

<table>
<thead>
<tr>
<th>Year</th>
<th>Personal Services</th>
<th>Maintenance and Other Operating Expenses</th>
<th>Capital Outlay</th>
<th>Development Fund</th>
<th>Others</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>45,204,641</td>
<td>5,555,768</td>
<td>680,000</td>
<td>10,469,457</td>
<td>4,452,420</td>
<td>66,362,586</td>
</tr>
<tr>
<td>2002</td>
<td>41,256,886</td>
<td>8,188,027</td>
<td>-</td>
<td>10,250,400</td>
<td>5,586,212</td>
<td>65,281,515</td>
</tr>
<tr>
<td>2003</td>
<td>40,197,187</td>
<td>8,716,400</td>
<td>-</td>
<td>10,232,455</td>
<td>12,393,357</td>
<td>71,539,399</td>
</tr>
<tr>
<td>2004</td>
<td>43,962,056</td>
<td>9,812,927</td>
<td>55,000</td>
<td>10,747,614</td>
<td>11,379,132</td>
<td>75,956,729</td>
</tr>
<tr>
<td>Average</td>
<td>40,655,192</td>
<td>8,068,280</td>
<td>183,825</td>
<td>10,424,982</td>
<td>8,452,780</td>
<td>69,785,057</td>
</tr>
<tr>
<td>% Share</td>
<td>61.1</td>
<td>11.6</td>
<td>0.26</td>
<td>14.9</td>
<td>12.1</td>
<td>100.0</td>
</tr>
</tbody>
</table>
The IRA is a major source of income, about 87% of the total income for 2003. Repair and maintenance of roads, highways and bridges accounted for 8% of the total MOOE. In 2003, 37% was spent on personal services, 33% on MOOE, 5.92% on capital outlay and 25% went to non-office expense.

For the 20% Development Fund, 2001 recorded the highest allocation for road construction/opening and repair of roads and bridges. In 2002, an amount of Php 20.0M each was allocated for roads and bridges and payment for loans. While in 2003, 39% of the Economic Development Fund was appropriated for the payment of loans.

5.4.5.1 Barangay

Most rural barangays are highly dependent on the annual allocation from national government of the LGU’s share of national revenues. For some barangays, this is their only source of income.

Key informants indicate that the allowances of most rural barangay officials are still below the ceiling prescribed by Department of the Interior and Local Government (DILG). Most started at PhP1,000/month for a council member. The prescribed amount is around PhP7,000/month. Considering the responsibility and amount of work expected of the officials, it is understandable that whenever there is an increase in income either from the national budget or from other sources, a commensurate increase in the officials’ meager allowances would be an option that would be seriously considered.

The population in each of the study barangays ranges from 1,000 to 3,000 people. The barangay road network lengths range between 3 and 9 kilometers of half concrete/half earth or asphalt road, with the majority of the earth roads highly deteriorated due to non-maintenance.

All of the barangays are located in marginal agricultural areas and all indicated that they have no other substantial source of income outside of the annual share of Internal Revenue Allotment from the national government.
Field validation

Visits to the 30 barangays provided insights on how rural road maintenance is regarded at the lowest level of local governance. The activity also provided the opportunity to validate findings at provincial and municipal levels, specifically on how rural roads are maintained. The consultations were mostly done in a formal and official manner with the Barangay Chairman presiding over a well-attended Barangay Council.

Some of the significant findings and observations during the consultations are in the following:

6.1 Institutional

- Barangay officials have acquired the skills to run their internal and external affairs, as manifested in how consensus is reached in allocating funds from the IRA.
- Bayanihan as a method in doing road maintenance is not sustainable as residents question the practice of working without compensation when barangay officials get allowances.
- Barangays look at the Congressman’s PDAF as a major source of additional funds.
- An approved barangay budget and AIP do not assure project implementation.
- A significant part of the barangay budget goes to allowances and other urgent expenditures, road maintenance is not a priority.
- Some barangays commit around 60,000 of their IRA for maintenance of ARCDP road.
- Most barangays generate year-end surplus which is used for allowances and other expenditures while awaiting the first release of IRA.
- Some Mayors accommodate requests and provide materials and manpower for barangay road maintenance.
- The Association of Barangay Chairmen (ABC) should be strengthened to rationalize coordination and cooperation between and among barangays, especially those obliged to maintain segments of a common road.
Barangays prefer maintenance by force account or pakyaw as they manage the activity, optimize the use of resources and can be assured of quality of delivery.

Long stretches of road make maintenance difficult for barangay residents.

There is no clear arrangement on barangay road maintenance.

The municipal engineer can be asked to monitor road maintenance, but often is not available to provide the service.

6.2 Financial

All barangays visited are dependent upon the IRA, with some declaring that their IRA practically determines the annual investment plan as there is no other source of funds available.

Lack of resources is always an issue, and other investment areas compete with meagre available resources.

Some barangays are willing to invest part of their IRA on concreting as they feel maintenance, like regraveling and grading, are rendered useless when the rains come.

Any additional expense, like toll fees for the use of a barangay road, will meet stiff resistance from motor vehicle owner residents since they have paid the municipality and the LTO for the use of their car and the road.

Barangay savings are committed, as a form of equity, to other NGO-led road improvement projects.

6.3 Technical

There is no updated barangay road inventory, but council members especially the chairman of the Infrastructure Committee, can update the inventory when asked.

Barangays, especially those in the upland areas, prefer the use of heavy equipment.

Some roads have been established but are not included in the municipal road inventory.

The concept of maintenance in some barangays is concreting.

Barangay road maintenance is mostly done as the need arises, i.e., when people find it difficult to use the road.

Barangays can only do routine maintenance.

Barangay officials discourage the use of carabao sledges as they destroys the road.
✧ The province can provide assistance to barangays on materials such as cement, gravel or use of heavy equipment.
✧ The province is better equipped to do road maintenance.

6.4 Political

The relationship between the barangay Chairman and the Mayor determines road maintenance possibilities.
The team's findings can be categorized under the general headings institutional, financial and technical. However, the study also established that rural road maintenance is very much related with leadership and with how the direct beneficiaries perceive their role in maintenance activities. The following summarizes the team's findings.

7.1 The Leadership Element

The study illustrates that development activities at local level, especially those that would require the use of local resources, should have the full support of the local chief executive (LCE). In most LGUs, the LCE is the acknowledged key person that will lead the people either to development or stagnation. It is evident that the rural areas are still experiencing a prolonged hangover from its feudalistic beginnings such that everybody looks up to the leader to decide on a range of issues. In current times, the thinking persists that an elected official is regarded by his constituents as the ready and convenient protector, provider and problem solver.

This perception is reinforced by the key informants who refer to the LCE as the leader whose decisions should not be questioned and whose support should be solicited right at the start of any development undertaking. To illustrate, the team received comments such as like, "there is no need to conduct a roads conditions survey as the LCE disregarded the last one and went ahead with his pre-conceived set of priorities," or "we may come up with the best development option but it is always the LCE's option that prevails." And still some stated that "if you want to have something done in the LGU, make sure you have the LCE with you."

It is therefore obvious that the LCEs - the Provincial Governor, Municipal Mayor and the Barangay Chairman - are the key LGU functionaries that can make things happen at local level, including maintenance of rural roads.
In some areas, where the Congressman and the LCEs do not cooperate, it was found that the office of the congressman also undertakes road improvements in selected barangay roads independently from the barangay leadership. The legislator's Philippine Development Assistance Fund (PDAF) is channeled through the DPWH that also executes the roadwork without proper coordination with the municipal and/or provincial governments.

Often, the politicians do not provide funds for the maintenance of the infrastructure thereby adding to the pressure on the LGUs' limited funds. In addition, as there is no maintenance planning in these initiatives, there is limited if not total absence of any understanding or appreciation that adding to the road asset stock is merely providing greater stress on the maintenance system.

7.2 The Social Element

It has been said that rural road maintenance is also a factor of beneficiary involvement. This topic is a favorite discussion item in various meetings and workshops where the debate pinpoints the beneficiaries' perception and sense of ownership of the infrastructure as a key element to guarantee involvement in road maintenance activities. However, the interactions with direct beneficiaries consistently point to lack of resources as a plausible excuse for the road's non-maintenance.

In rural areas where residents are concerned with day-to-day existence, attention to the maintenance of an access road is probably not in the list of their priorities. Take for instance this road that connects a remote barangay to the provincial road. Rain, which is quite abundant in the area, results in waterlogged road sections making travel difficult and expensive and motorcycles remain the only reliable form of public transport. It is obvious that the lowering of the carriage-way due to loss of surface material and the disappearance of side drains because of years of non-maintenance resulted in this road condition. The people however, still use the road.

In most barangays, residents do not pay much attention to the roads for as long as they are passable. It is only after the rains when the infrastructures become difficult to negotiate that clamour for immediate maintenance is expressed. By such time, much damage has been done and maintenance only provides a temporary relief, until the next rains come.

Some roads are maintained, i.e. graded, in preparation for an event that will bring people to the barangay, like a town fiesta celebration. Such an event is
a tradition that the whole community looks forward to and spend months on preparation alone. To express the community's warm reception and ensure that visitors will indeed come, the access road is smoothened just for the event. The maintenance activity, depending on the condition of the road, is repeated in time for the next celebration.

In long stretches of road servicing several communities, maintenance should always be an agreement between the affected barangays. As the action of one affects the rest, coordination between and among the affected villages becomes obvious. During meetings it was clearly established that a barangay located midway along the road would not maintain the road section in its territory if the other barangays do not maintain their respective sections. This inaction due to lack of coordination can lead to the deterioration of the road such where the concrete side drains are useless as they are not only covered with debris but are higher than the carriage way resulting in rain water remaining in the middle of the road. Such a condition requires expensive periodic maintenance.

There are instances when the barangay residents open a road to link the households to the main road. Having been identified by the users, this road is used until the government decides to build a new and better road that allows more motorized means of transport to come in. Vegetation soon reclaims the old road after the users abandon it, yet it remains listed in the barangay inventory as an access road. Today, only a track and a trail remain of what used to be a road for motorcycles and a few residents on foot. There are many similar incidents in various parts of the country that could have been prevented if there was proper coordination between and among concerned people.

7.3 Institutional

The team also looked at government institutions, their capacity and commitment to treat maintenance of these transport facilities as part of their mandated responsibility of providing and delivering public service to the people.

It has been noted that maintenance capacity is high at provincial level, lower at municipal level and very minimal at barangay level. The engineering offices at provincial and municipal levels are tasked to maintain transport infrastructures of their respective LGUs. The engineering offices of first class provinces are endowed with a full manpower complement and provided with a significant annual budget allocation. Some PEOs operate with a balanced fleet of heavy equipment and mobile engineering teams and
around 200 technical and administrative staff. However, in some municipalities, the Engineering office only has the Municipal Engineer with a few casual employees hired on an "as needed" basis. At barangay level, there is no technical unit in place but they are still expected to attend to barangay roads as they have the 20% IRA development fund that they can use to cover expenditures.

It is clear from the study that rural roads maintenance is not a priority at provincial and municipal levels.

An examination of provincial and municipal annual budgets indicates allocations for road maintenance. However, key informants reveal that such allocation are often re-aligned for other uses. Some key informants added that funds are allocated for road maintenance as a ready reserve that can be re-aligned later through local legislative action. They also noted that rural road maintenance is regarded as an "invisible" undertaking, unlike high-profile road construction or rehabilitation where billboards highlight the initiative of elected officials and provide a sustained and effective advertising mechanism.

Barangay officials, on the other hand, lament that it takes the issuance of countless barangay resolutions just to get assistance from the local chief executive or the legislator. One Barangay Captain stated that they could
never relent on knocking on the doors of officials of higher-level LGUs as competition with the other barangays is always present.

A big concern among local government units is the limited resource provided to them. There is a prevalent feeling, especially among barangays, that funds received from national government are not enough to meet the needs of the local government. In addition, the budgeting system of the country is such that the Internal Revenue Allotment (IRA), a main source of local funds, is released in 12 equal installments obliging the LGU to wait until enough funds are in before entering into any maintenance contract. For instance, the funds to cover a PhP60,000 worth of work will be fully received only during the last quarter. This means that activities can only start sometime in November, just when the rains have stopped and significant damage is already done on the road. In addition, the LGU's limited resource only allows routine maintenance measures such as filling up of potholes, clearing of fallen trees and debris, vegetation control and/or cleaning of what remains of drainage ditches. Most maintenance activities are done through force account as LGUs feel they can optimize the use of their limited resources.

7.4 Technical

If the current conditions of the "maintained" roads are to be used as yardstick to measure the current technical capacity of the LGU engineering offices, then it can be concluded that the capacity is very limited.

In the first place, information to guide rural road maintenance decisions is not available, inaccurate or outdated. Often the information on the location and condition of roads at provincial and municipal levels do not tally, while barangay consultations revealed that a number of barangay roads are not listed in the municipal inventory.

The total length of municipal roads in provincial inventories does not tally with the more detailed inventory at municipal level in almost all of the study provinces. Some inventories based on surface material used and conditions are not complete while the inventory forms used are not consistent between the different levels of LGUs.

During barangay consultations, existing road segments were pointed out to be not in the municipal road inventory. An average of about 2-3 barangay roads per municipality are not in the inventory because of several reasons, prominent of which is that roads are technically still private property as
there has been no official turnover. This " unofficial" status of barangay roads can give rise to a number of auditing problems, such as how to justify allocating public funds to improve portions of a private property, or improvement done on such a road for the public interest will be rendered useless should the owner deem it necessary to close the road.

In Bataan, the Assessor's Office declared that a number of barangay road lots donated to the LGU by the owners have not been officially accepted and therefore remain private property. In Albay, a consultation workshop conducted by the Provincial Planning and Development Office (PPDO) and attended by municipal and barangay key informants led to an increase number of barangay roads in the provincial roads inventory.

Most of the PEOs in the study areas do not prepare a road maintenance plan but instead prepare a program of work and procurement plan based on an ocular inspection of specific road segments. The PEOs occasionally receive requests from barangays for assistance in maintaining barangay roads. In such cases, an Area Engineer, Foreman or Capataz is sent to conduct an ocular inspection and writes a report to the Provincial Engineer. These requests are prioritized for consideration in the annual investment plan.

Maintenance Planning at the provincial level is only limited to identification of priority road section and the preparation of a Procurement Plan. If the Provincial Engineering Office does not propose a maintenance budget for the year based on road maintenance requirements of the provincial roads, the Provincial Finance Committee simply allocates a fixed amount for the PEO to work with. In most instances, this is less than is needed to cover the necessary repair and maintenance work.

Municipal key informants said that the minimal length of roads under the Municipal Engineering Office's jurisdiction does not require a plan. Instead, the MEO implements maintenance activities as the need arises, or as a reaction to barangay resolutions received by the office.

At barangay level, maintenance planning is taken up during the Barangay Development Council (BDC) meeting where projects to be implemented for the coming year are discussed and decided upon. The meeting also covers how the 20% development fund should be allocated, usually based upon perceived needs as expressed by the residents' representatives.

There is no standard mapping in place, map information is inaccurate making integration of information difficult. There is no common mapping technology used in the study LGUs. Some have computer-generated maps in GIS format, others use the 1:50,000 topographic maps issued by
NAMRIA while others draw their maps manually. Most barangays maintain hand-drawn rudimentary maps with outdated and inaccurate information.

Key informants indicated that geographic information is updated only when a foreign-funded project would come and provide resources to update the information. The absence of a mapping technology common to provincial, municipal and barangay LGUs result in independent map outputs, drawn in various map scales, thereby making integration of geographic information a tedious exercise. For instance, it would be difficult to update a provincial road map by piecing together municipal road maps as these are produced using different mapping methods and are in a range of time horizons and of various scales.

The road inventory is not updated at all levels and some LGUs still use the old DPWH inventory without updating and/or validating the information.

Decentralization provided each LGU the flexibility to explore different routes to attain a common development objective but in the process neglected some that are essential for maintenance planning, such as road inventory and road conditions survey.

Some PEOs stated that they periodically updated their road inventory and conducted road conditions surveys. They used these to identify and recommend road segments for either rehabilitation or maintenance. However, the local chief executive ignored these recommendations and went on to implement his own infrastructure development program, so the PEO stopped doing these activities as they felt decision-makers do not need them.

Barangay consultations reinforce this finding, as an average of 2-3 barangay roads per municipality are found not listed in the municipal road inventory. Municipal authorities opined that a number of these barangay roads were started by private landowners to access their property. Soon, these new road openings became public access even without official declarations and/or deeds of donation.

Road condition surveys are not properly and regularly carried out and no standard procedure is observed. Key informants from most of the LGUs studied reveal that road conditions survey is not generally carried out. Instead, the reports of the area engineers, foremen and/or capataz describing the physical status of specific road segments constitute the road condition survey. Considering the capacity of some provincial and municipal engineering offices, not all roads can be visited and evaluated by field personnel. In addition, some of these activities are reactions to barangay resolutions requesting for assistance in maintaining barangay roads. The pattern among the LGUs studied indicate that road conditions
survey is done as a reaction to demands from an investment programme, and not as a regular activity to guide changes that would result in responsive and intelligent development decisions.

Upon random examination of those road inventories that are maintained by the provinces and municipalities, it has been observed that the items describing the roads are not consistent in all the inventories. For instance, some items like surface material and its condition are not reflected in some documents. In addition, the confusion in road classification tends to result in some roads listed twice.

There is no standard monitoring of road maintenance. Years of improper maintenance work result in significant damage to the rural roads. Loss of paving material, lowering of the carriageway and disappearance of side drains are some of the substantial damages done on the road. Key informants state that in some roads that need resurfacing, incorrect materials are brought in and the excess and unwanted portions are pushed to both sides of the road thereby covering the side ditches. The aim of the grader operator is to produce a smooth road surface acceptable enough for the motorists’ riding comfort without due concern given to standards and norms. When the rains come, the excess material become a wall that will prevent surface water from draining away from the center of the road.
It should be standard practice for area engineers to inspect maintenance work done by their crew of laborers and heavy equipment operators. In LGUs with not enough field personnel to take on this task, the responsibility of ascertaining whether the maintenance output achieved its objective or not is left to people who do not have any technical training or background.

Key informants complain that the engagement of heavy equipment is a subsidized activity by the higher-level LGU. Consequently, the barangay has to contend with short working hours and the operator doing activities for private individuals on private property.

Most barangay roads visited are observed to be lower than the surroundings. It will only take one rainy season for the road to deteriorate, as surface runoff cannot be drained away from the road and accumulates in the middle to erode whatever surfacing material was placed during maintenance. Key informants admit that this happens on an annual basis such that some barangays are forced to allocate a significant portion of its meager resources to pay for the rental costs, fuel and lubricants, allowances of the grader operator, and wages for laborers.

The productivity standards used vary among LGUs. Cost estimation is still based upon productivity standards prescribed in various rural road maintenance manuals published by the DPWH and the DILG. Key informants mentioned that they still rely upon these documents to compute for materials needed, the number of man-hours required and the choice for the appropriate maintenance scheme. Costs for items needed in maintenance vary depending on the location of the infrastructure, like the distance from source of materials, availability of manual labor, the LGU’s income class, etc.

Provinces and municipalities avail of bank loans to purchase heavy equipment for road construction and maintenance in their respective areas. Use of these heavy equipment entails substantial costs such that these are rented out to contractors, or even barangays willing to shoulder fuel costs, allowance of the operator and a subsidized rental rate. There is now an emerging business partnership between the barangay and the higher level LGU with heavy equipment. However, some key informants stated that it is better to rent heavy equipment than seek assistance from the province or municipality as they cannot control the whims and caprices of the heavy equipment operator. As there is no immediate supervisor on site during maintenance operation, the operator becomes the authority and in most instances, applies his standard in executing the work.
PEO maintenance personnel do not have the necessary training to upgrade their capabilities and enhance knowledge on their area of work. Current maintenance practices are not based on prescribed procedures or standards but rather on whether the outcome is acceptable enough. On the other hand, the level of awareness of the beneficiaries, like barangay officials monitoring the road construction and/or maintenance work implemented by LGU-provided construction team can be said to be not high enough to determine the good or bad side of construction and/or maintenance delivery.

There is a general lack of technical assistance to barangays. In lower class municipalities, the Municipal Engineers are burdened with a lot of responsibilities and do not have adequate personnel support to extend assistance to barangays on a regular basis. These actions, if indeed extended are done "as needed" or in emergency cases. In addition, the lack of adequate logistics also leads to improper, or lack of, supervision of maintenance work in the field. As admitted by municipal engineers, during work on barangay roads, the heavy equipment operators are the only personnel in the field augmented with occasional visits by the maintenance foreman.

Consequently, barangays are left to undertake maintenance activities mostly on their own. This lack of capacity among engineering offices results in technical assistance which may not be appropriate due to the technical staff’s lack of training. This results in more pressure on limited resources of the LGUs as the roads deteriorate quickly.

### 7.5 Financial

The level of LGU financial resources, capacity and leadership have been identified as the primary reasons that would determine rural road maintenance. These, when present in a desirable proportion, can make other elements fall in place and ensure proper road maintenance can be realized.

In the first place there is only limited budgets for barangay road maintenance. Barangays generate an annual total income in the vicinity of PhP500,000 - 1,000,000 from where they get all the resources needed for governance and development needs. Maintenance of the roads under their jurisdiction constitutes a major portion of this annual budget.

In addition there is only limited road maintenance budget at the level of the municipalities. Considering that there are very few municipal roads, municipal governments do not allocate substantial budgets for road maintenance. They assume that the barangays already have their own IRA, and that they are not primarily responsible to maintain barangay roads.
The Local Government Code of 1991 provided the local government units the autonomy and flexibility to plot their respective paths to development. The Code decentralized decision-making to local elected officials and devolved functions and responsibilities that used to be within the mandates of national government agencies. The government's policy of decentralization, devolution and autonomy resulted in more resources pouring into local government units leading to rapid development of most of the LGUs. The local leadership, with sufficient resources at their disposal and with a short 3-year term of opportunity to contend with, embarked on development activities that are not only needed in the LGU but are likewise perceived as tangible achievements of their administration that they can show to the electorate when the time of reckoning comes. These development activities are high profile and very visible infrastructure projects that openly declares the parties responsible for bringing it to the people. Unfortunately, a significant number of these major investments are in roads and the assets are fast deteriorating due to neglect and misuse by those tasked to oversee their operation and maintenance.

The study confirms that some LGUs indeed maintain their rural roads, but most do not. Whilst Barangays are responsible for half the road network of the country, the resources and technical capacity they possess are insufficient to address the task. Although assistance is sought and provided by the higher-level LGUs, still the rural road maintenance actions are not enough as the majority of the barangay roads are in an advanced state of deterioration. Routine and periodic maintenance activities can bring them back to a maintainable condition. Years of non-maintenance have resulted in loss of surfacing material, loss of important side and cross drains and proliferation of unwanted vegetation.

Much of the engineering component of rural road operations and maintenance have been laid out by various technical agencies and officially acknowledged in manuals and guidelines. These can be effectively brought to the fore through the LGU leadership channels and executed by the engineering offices of local government units.
A flow chart showing how rural road maintenance should be addressed is shown below.

Whilst appearing sample, the study has shown that at each stage of the process limitations of resources and capacity at the LGU level ensure that much a process is ready adopted.

The following actions are recommended to address the issues and concerns on rural roads operations and maintenance.

8.1 Reallocate the responsibility for barangay road maintenance to the Province.

It is unrealistic to expect the 41,969 barangays in the country to ever have the capacity to maintain the tertiary road network of the country. The level of improvement to be made in the technical capacity and the changes needed in the financial procedures are massive and out of proportion to the size and importance of individual barangays. In addition barangay roads form part of the road network of the country and have importance far outside the purview of the barangay. Maintaining the health centre or the primary school is of direct and unique concern to the barangay. Maintaining the barangay roads has to be seen in the framework of the network as a whole and requires a broader approach than that which can be applied by individual barangays.

In general Municipalities also have limited technical and financial capacity. A case could be made for giving the barangay road maintenance responsibility to them. However the unevenness of the level of capacity would mean that it would be difficult to apply a standardized responsibility to them.

The Province therefore seems to be the obvious location for this responsibility. It might be added that in 1991 the Code took the responsibility for barangay roads away from the agency with the most technical capacity, the DPWH, and gave it to the LGU, the barangay, with the least.

Giving the Provinces the responsibility has the obvious advantage that the Province has both technical and financial capacity. In addition it places the responsibility for the sustainability of the secondary and tertiary network of the Province under one administration. This has clear benefits in terms of network planning, budgeting and implementation modalities.
8.2 Develop advocacy campaign to convince decision-makers on the merits and benefits of maintaining rural roads

An advocacy campaign highlighting the need for proper, appropriate and timely rural roads maintenance should be waged to convince local decision-makers on the merits of such activities. Experience from other countries suggests that emphasising asset management is a more convincing argument for politicians and decision makers than dwelling on transport costs or riding quality of the roads. Pointing out the benefits of maintenance of national assets during their tenure of office may convince politicians that there is political advantage in promoting the concept.

Advocacy materials can be designed and produced along this line and disseminated to the elected officials and leaders at provincial, municipal and barangay local governments. The campaign should not only raise awareness among the decision-makers but among the beneficiaries as well. In addition, it is certain that the advocacy campaign will be a protracted struggle such that steps should be taken to explore the possibility of incorporating the consciousness on rural road maintenance in the curricula of educational institutions.

The targets of the advocacy campaign will be those who make decisions on LGU development and investment plans, particularly the members of the LGU development councils and legislative bodies who decide on the appropriation of LGU resources. The engineering offices at all LGU levels and the designated barangay officials would also be targeted so that they can bring forward solid arguments for the consideration of the local decision-makers.

![People served by the road over time](image)
The figure above demonstrates the loss of benefit through lack of maintenance to those whom the road is intended to serve the, the rural people.

In financial terms, any further example from road works under the INFRES project illustrates the point.

The rehabilitation of a 7-kilometer gravel farm-to-market road in San Jose, Mindoro costs around PhP11.350 million. Under normal use and with proper maintenance, this road is projected to last 5 years. Current maintenance costs is estimated at PhP57,000/kilometer.

Cost of rehabilitation: PhP1.62 million/km
Cost of maintenance: PhP57,000/km/year
Ratio of annual maintenance to rehabilitation cost .057/1.62 or 3.5%

Annual maintenance costs represent only 3.5% of the rehabilitation costs.

With no maintenance the road will need to be rehabilitated after 5 years. The cost of maintenance over 5 years ensuring that the road remains in a reasonable condition is only 17% of the cost of rehabilitation.

8.3 Design and implement capacity building program for technical staff and decision-makers on rural roads maintenance

Most technical staff of the local government units responsible in overseeing rural roads operations and maintenance admit that they are not trained on proper and appropriate rural roads maintenance technology and schemes. A number of training programs have been designed and applied and have been proven to work especially in an environment of enlightened local leadership.

The International Labour Organization (ILO) developed and successfully applied training modules on rural road construction and maintenance using labor-based equipment supported methods in several developing countries in Africa and Southeast Asia. These modules reinforce ILO programs of decent work and rural employment generation and a significant amount of materials have been produced along this line.
8.4 Orient and train other concerned parties, like NGOs, community organizations and interest groups on proper rural roads operations and maintenance processes

Rural roads operations and maintenance is not only a concern of LGUs and beneficiaries but by other interest groups like NGOs and ongoing projects as well. Most foreign-assisted development projects oblige beneficiary LGUs to commit to maintaining the infrastructure even after the assistance is finished. A committee constituted to oversee such activity should be familiar and aware of the road maintenance needs to guide their actions and decisions.

Local residents can be tapped to form and be trained as maintenance crew to do slope protection, vegetation control and/or cleaning and clearing of side drains, such as the practice in this road in Bangladesh. The LGU road maintenance commitment will cover the resources needed for the activity.

Farm-to-market roads are vital links that help improve the living conditions of rural households as they gain better access to opportunities, information, technology and basic services. Preventing and/or arresting the deterioration of this transport infrastructure, by keeping it in a reasonable state using reasonable amount of resources with the active participation of local leaders and beneficiaries, is an objective that must cut across all forms of local development initiatives. It has been established that an effective way to attain this is for all concerned to view the road as a valuable asset that must be preserved.

Sound and participatory local decision-making to optimize the use of limited resources and capacity to attain realistic development objectives is the only way to go. This is what decentralization, devolution and autonomy is all about.
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**ASIST AP** is a regional programme of the Employment Intensive Investment Programme (EIIP) of the ILO, concerned with developing and mainstreaming poverty alleviation strategies through sustainable infrastructure development. The programme is implemented through four major fields of operation, viz: accessibility planning, labour-based works technology, small-scale contracting and infrastructure maintenance, thus providing a comprehensive approach to infrastructure development covering all stages from planning and construction to maintenance and operation.

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