



The Impact of Roads Upon Local Small and Medium Enterprises in Manggarai District, NTT Province



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Rural Investment Climate Assessment Website: www.worldbank.org/id/rica

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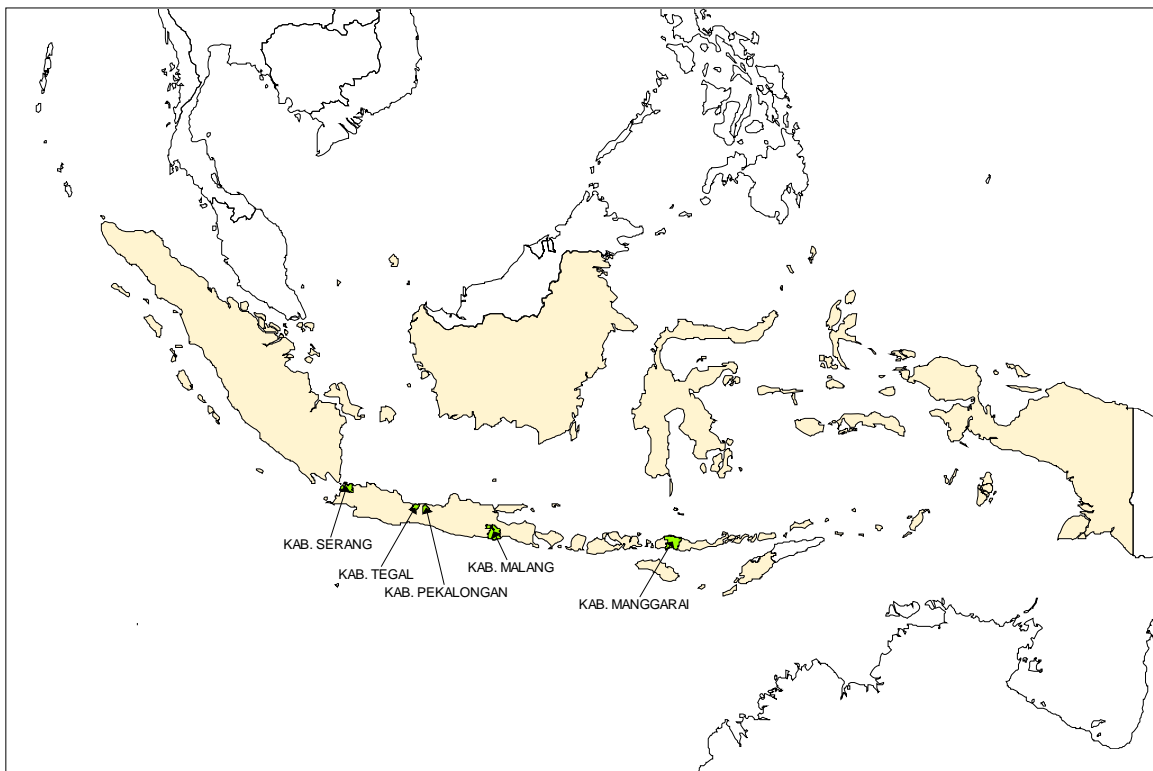
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The initial phase of the RICA project has four components: the Rural Investment Climate Survey, National Conference on the Rural Investment Climate, and five case studies that complement the quantitative survey with qualitative research. The case studies were designed to increase understanding of the policy and institutional setting and how it influences the failure or success in implementation and outcomes. The RICA Case Studies were chosen around five themes where knowledge gaps exist or where good examples of innovation have been found. The knowledge gained from these case studies will be incorporated into the RICA Report.

For more information on the RICA project, please refer to www.worldbank.org/id/rica.



Case Study 5: Roads in Manggarai District, East Nusa Tenggara: Infrastructure Decline and Impacts on Business and Communities

ABSTRACT

Poor road conditions in Manggarai District are having a negative impact on local businesses by increasing transport costs, reducing access to raw materials and inhibiting the ability of local businesses to participate in higher value-added activities.

There are three main reasons why road conditions in Manggarai are bad. First, the budget for roads is very small. The DAU funding formula poses particular problems for maintaining the road network in large but sparsely populated districts, such as Manggarai. The local budget allocation process does not prioritize roads, focusing instead on the large civil service budget. Further, districts do not control the principal road-user taxes and are therefore not able to raise funds commensurate with the costs imposed by users on the road network.

Second, within the road budget, there are competing needs between new road building and upgrading and the maintenance of existing roads. While routine maintenance is cheaper and more cost-effective in the long-term, upgraded asphalt roads have a stronger short-term impact on voters. As a result, the budget process tends to bias expenditure away from maintenance.

Finally, the alliance between contractors, politicians, and government officials responsible for road construction and maintenance reinforces the bias toward larger capital-intensive roads projects despite evidence that smaller labor-based projects might be more appropriate in several locations. Leakage of project funds also increases costs and reduces the quality of roads constructed.

This paper outlines these processes and puts forward a series of recommendations for reform to restructure the incentives faced by local stakeholders to be more consistent with the delivery of a higher condition road network that meets the needs of the Manggarai population.

This case was written by Jennifer Donohoe. Research was based on fieldwork undertaken in Manggarai district in August and September 2005; team members included Janes Imanuel Ginting, and Novia Cici Anggraini. Analytical and managerial support by Neil McCulloch, World Bank (Indonesia), and Stefan Nachuk, World Bank (Indonesia). Editorial support was provided by Juliana Wilson, consultant (U.S.A). See Bibliography for works referenced. This case is copyrighted by the World Bank and may not be reproduced or reused without its permission

INTRODUCTION

Good quality roads are an essential requirement for economic development. Numerous studies show the close connection between the condition of infrastructure, growth, and poverty reduction. But road infrastructure in many parts of Indonesia is in poor condition, creating a significant obstacle to development in these areas. This study explores the impact of poor roads on non-farm businesses in one poor remote region, Manggarai District on Flores in Nusa Tenggara Timur, and seeks to understand why the district roads there are so bad. In particular, it examines whether low expenditure on road maintenance is due to a lack of funds, the nature of the budgeting and planning process, or the incentives faced by the various bureaucratic and political actors in the district.

MANGGARAI DISTRICT

Manggarai is located in Nusa Tenggara Timur province on Flores Island between the districts of Manggarai Barat to the west and Ngada to the east. The district is large, covering 4,188 km² of mostly mountainous farmland and forest but has a population of just 481,679. The district capital, Ruteng, is located in the central eastern mountains of Manggarai, approximately 6 hours drive from Manggarai's largest port of Reok to the north and four hours from Labuanbajo, the capital of Manggarai Barat, where the majority of sea traffic to Java departs.

Manggarai has 12 sub-districts. The poverty rate for the district is 48%, with some sub-districts having a poverty headcount as high as 59%. Over 40% of the population has not completed primary school. The total labor force of Manggarai is 326,916 and the open unemployment rate is 2.4%.¹ In 2002, the provincial minimum wage was set at Rp. 330,000 per month (approx. USD 1.1/day) but the average real wage was only Rp. 127,600 per month (approx. USD 0.5/day). Almost ninety percent of the population is involved in primary production, and 53% of GDP came from agriculture in 2003, including fruits and vegetables, rice, cassava and maize.

Micro and small enterprises² make up a large proportion of the off-farm sector.³ There are only a few medium-scale enterprises in the district and the local government had no available records of large enterprises.⁴ Most micro industries are household-based weaving enterprises or kiosks. Weaving has been carried out for generations in four sub-districts, Cibai, Elar, Satarmese, and Sambi Rampas. In 1999, the Department of Trade and Industry found there were at least 700 household weaving enterprises in these sub-districts. In a few areas, machete making is also a common household enterprise.

The majority of the population (89%) is Catholic, followed by Muslim (10%), and less than one percent for other religions. The Catholic Church plays a large role in the community, particularly by providing education and health facilities. It has also been involved in road and irrigation infrastructure projects with both private and government funding although recently this has been of limited scale.

¹ Figures on the workforce are given as "population above the age of 10 years in employment"

² Micro industry is defined as an enterprise with assets of less than Rp. 5 mil. Micro enterprises are usually listed with the Department of Trade and Industry but are not required to have a permit (SIUP). Those that do register usually do so when applying for credit as the SIUP is one precondition from most lenders. Small enterprises are those that have assets between Rp. 5 mil and Rp. 600 mil and hold a business license (SIUP). Source: "Manggarai Dalam Angka", BPS Manggarai, 1999-2003. Telephone interview with the Sub-Head of the Department of Trade and Industry Manggarai, 15 September 2005

³ The latest figures (2003) show that small enterprises in Manggarai include chemical manufacturing (3.5% of total SMEs), metal, machine, and electronic (4.3%), agricultural product processing (25.7%), and "other industries" (66.5%). Over 40% of all small industries are located in or around the District capital of Ruteng as there is better access to markets. Other centers are kecamatan Borong, which is the main sub-district for agricultural production, and kecamatan Reok, where the District's major port is located.

⁴ Interview with the Head of Bappeda District Manggarai, 20 July 2005 and the Head of the Department of Trade and Industry, 21 July 2005. No comprehensive data is available in the district on the total number of enterprises.

Manggarai held its first direct election for Regent in July 2005. The winning candidate; Regent Christian Rotok defeated the previous Regent with the support of several small parties. Before the direct elections, Golkar dominated the parliament; however, the current composition of the District Parliament (DPRD) is mixed, with Golkar holding just 11 seats and PDI-P 8, while PKB, Pelopor and PKP all received four seats, while the remaining nine seats were shared between eight small parties.

KEY ACTORS

The Regent is a key player in decisions on planning and budgeting for road building and maintenance and has executive power over the draft development budget (RAPBD). The current Regent has only been in power since July 2005, and had not yet been inaugurated when field research for this paper was carried out.

The District Planning Board (Bappeda) is very influential in the planning and budgeting process as it facilitates both the participatory planning process (Musrenbang) from the sub-district level, and coordinates the technical studies and surveys conducted for decision-making on the roads budget. Bappeda is responsible for compiling and finalizing the planned road budget each year before presenting it to the DPRD.

The Regional Department of Public Works (Kimpraswil), assists Bappeda in preparing the road development plan and budget, and has control over implementing government roads projects. Kimpraswil leads the tender process for road building and maintenance, and is responsible for monitoring these projects as they are implemented.

The District Parliament (DPRD) has increasing influence over the budget and development plan since the new decentralization laws were passed in 2004. The body has “hak anggaran” or right to agree or refuse the budget proposed by the executive. Some DPRD members also participate in the annual bottom-up participatory planning process (Musrenbang) in order to ensure they are informed of their constituents’ needs.

Large contractors and other businesspeople are influential in Manggarai and are actively involved in local development and politics. Contractors involved in government projects work closely with Kimpraswil.

Some vocal members of **the Church**, and the Catholic Church’s development organization, Delegatus Sosial - DeoSos, have links with decision makers. DeoSos managed to obtain a part of the government’s development budget from 2002-2005 to use in building small, labor-intensive infrastructure projects in poorer areas of Manggarai. The church is also able to attract foreign donations for projects in the area.

There are several **local NGOs** working on different community development projects in Manggarai. One local NGO, Yayasan AYO Indonesia, was established to continue the work of a donor-funded roads project, Swiss Intercorporation, which was responsible for building 178.8 km of Telford⁵ road and 43.2 km of dirt road in poor areas of Manggarai from 1985 to 1996. Yayasan AYO Indonesia wants to continue this project but has as yet been unable to obtain funding.

⁵ Cobble roads designed by Thomas Telford in the 1800s with an engineering method that, if followed correctly, ensures durability and strength.

METHODOLOGY

To examine the questions about the impact of poor roads and the reasons for low maintenance expenditure a qualitative methodology was used. Field research was carried out between August 29, 2005 and September 10, 2005. Semi-structured interviews were conducted with government agencies involved in the planning, budgeting and implementation phases of road building and maintenance, along with those responsible for supporting small and medium enterprises and individual entrepreneurs in the district capital. Two sub-field visits were carried out in Cibai and Elar sub-districts to obtain a deeper understanding of road infrastructure and the economic and social conditions in rural Manggarai. Finally, two focus group discussions (FGD) were held with non-government representatives, including members of the media, NGOs and the Church, and with local businesspeople in order to gauge the relative importance of roads for social and economic development.

Research Questions and Hypotheses:

This research addressed three research questions, and related hypotheses:

1. Have road conditions declined in Manggarai over the past five years?
2. Has declining road conditions strongly hinders development of Non-Farm Enterprises.⁶
3. Why have road conditions been declining in Manggarai over the past five years? What factors have influenced this decline, and which have the strongest effect on road conditions?

Hypothesis – A major cause of the decline in road condition over the past five years is lack of sufficient budget allocation for maintenance.

THE STATE OF AND TRENDS IN ROAD CONDITIONS IN MANGGARAI

There are 1,931.46 kilometers of registered state roads in Manggarai as of 2003⁷. Of this, 1,520 km, or 79%, are classified as district roads, 14% as provincial and 7% as national roads. Overall, road conditions in Manggarai are very poor. The government currently (2003) classifies 56% of all roads as being in a bad or very bad condition. The proportion of bad or very bad roads in Manggarai was slightly lower than the provincial average in 2003 but much higher than the national average of 48%.

As can be seen in Table 1, roads under district government authority in Manggarai are in the worst condition. About 1030.74 km, or 68%, of the district's road is in "bad" or "very bad" condition.

Box 1. Basis for Government Classifications

1. Technical → the speed of vehicles
 - a. **Good:** > 30 km/hour
 - b. **Moderate:** 15-30 km/hour
 - c. **Bad:** 5-15 km/hour
 - d. **Very bad:** < 5 km/hour
2. Topography and surface condition
 - a. **Good:** passable at any time
 - b. **Moderate:** passable at any time, but using slower speed at particular times – e.g. during rain.
 - c. **Bad:** impassable at particular times – e.g. during the rainy season – or only passable using a four-wheel-drive vehicle
 - d. **Very Bad:** impassable at all times except using a four-wheel-drive vehicle

⁶ All enterprises other than agriculture, fishing, forestry and mining. Can include such enterprises as milling and other enterprises related to agriculture

⁷ Manggarai Dalam Angka, 2003. Other government documents, such as NTT Dalam Angka, state that Manggarai has 2,202.60 km of road.

Table 1 – Road Condition in Manggarai by Government Authority and Compared to NTT Province and National Averages - 2003 (%)

	Good	Moderate	Bad/ very bad
Roads under National Government Authority	51	27	22
Roads under Provincial Government Authority	35	60	5
Roads under District Government Authority	10	22	68
Manggarai Total	17	28	56
% NTT Average (2003)	18	21	61
National Average	19	33	48

Sources: *Manggarai Dalam Angka, 2003*; *NTT Dalam Angka 2003*, *National Data - World Bank 2004*.

Table 2 – Manggarai: Length of Road by Road Surface - 2003 (km)

	Hotmix	Asphalt	Aggregate & Telford	Soil	Total
Total (km)	254	693	488	497	1,931
% All Roads	13	36	25	26	100
% Roads under District Government Authority	2	33	32	33	100

Source: *Manggarai Dalam Angka, 2003*

District roads that link sub-districts to the district capital and to provincial and national roads are a priority for businesses. These roads are the main conduit for agricultural produce on the one hand, and agricultural inputs on the other. Poor condition village roads on the other hand make it difficult to get agricultural goods out of the villages and reduce villagers' access to public services.

Road surface is also a determining factor of road condition. In Manggarai a third of district roads are soil, and are generally impassible for regular road transport for the two months of the wet season (**which months?**) as their dirt roads turn to impassible mud. Only 2% of

roads under The District government have been covered with the stronger "Hotmix" type of hot asphalt mix. The other 65% is regular asphalt, aggregate or Telford road surface. Asphalt provides a smoother, stronger surface; however, it requires regular (annual) maintenance or it will quickly degrade and is quite expensive to build. Aggregate provides a strong surface and a cheaper option than asphalt, however, without suitable drainage it has a tendency to erode particularly under the very high rates of rainfall in Manggarai. Telford is a type of cobbled road that can be a strong and cheap alternative, and if built correctly will withstand heavy rainfall.

An Inexpensive, High-Quality Method of Road Construction

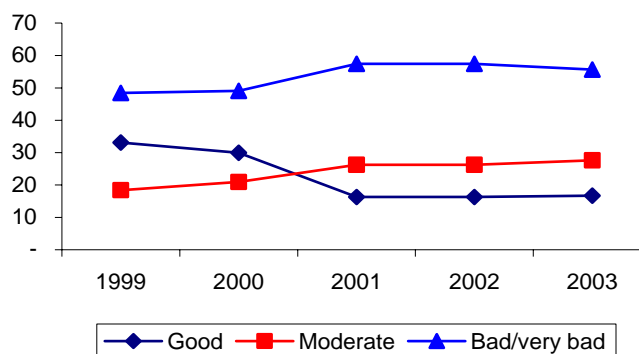
Villagers, if organized, are capable of building and maintaining Telford roads, but do not have the skills or equipment to build or maintain asphalt roads. The Telford road-building method has been successfully implemented in Manggarai through donor-funded projects, and more recently through the sub-district Development Program and the Church. The first program for building Telford roads in Manggarai was funded by the Swiss government Intercorporation and resulted in 222 kilometers of road in remote and poor areas of the district. The roads are best built with strong community participation and therefore require intensive facilitation. One of the drawbacks to building Telford roads is that they take time to construct—a normal pace is about one kilometer per month. The benefit is that the roads are much cheaper to build than asphalted roads, especially when the community provides labor and local materials at a discounted rate to complete the project.

These roads tend to be better maintained, as communities directly benefit from them, and take ownership over their care. Since the Swiss roads project finished in 1996, one church-based social organization, DelSos, has been able to convince government to provide it with funding to build Telford roads during the past three years on a very small scale, and has been successful in terms of cost and creating community ownership. Many of the proposed sub-district projects for the sub-district Development Program have included stretches of Telford road to link communities to markets and public services.

TRENDS IN ROAD CONDITIONS

There was an increase of 15% in the share of roads with “bad/very bad” condition relative to total between 1999 and 2003 from 48% to 57%. Moderate condition roads increased slightly in the first part of the period also reflecting the 10% decrease in the proportion of roads in good condition. For district roads, the trend is stronger, with almost a 16% increase in bad and very bad condition roads between 1999 and 2003 and a huge drop to only 10% of roads in good condition.

Chart 1: Overall Road Condition - Manggarai



IMPACT OF POOR ROAD CONDITIONS UPON ENTERPRISES

Since many factors affect the investment climate in Manggarai, it is difficult to establish a clear link between declining road conditions and poor economic performance. Nonetheless, it is possible to document the links between poor quality infrastructure and impacts upon communities and enterprises. We explore two of these links in more detail – increased travel time and increased costs.

Increases in travel time...

In comparison to many other areas in Indonesia, road conditions and associated travel times are much worse between Manggarai and its main business destinations. It takes approximately one week for a loaded truck to travel from Ruteng to Surabaya, a similar distance as Jakarta to Surabaya, but the latter trip only takes two days.

Road conditions are so bad that in some cases farmers and intermediary traders take extremely roundabout routes to sell their produce. For example, the 40 km road between Pota, Elar Sub-district, and the sub-district capital, Lengko Elar, is of such poor condition that farmers and traders must travel on foot or by horse for eight hours each way. If they or intermediary traders wish to transport goods between these two areas they have to travel over 100 km from Pota to Lengko Elar by taking the provincial road east, then south to Ruteng and west again to get to the sub-district capital. The Pota-Ruteng leg of the trip takes 10 hours and the Ruteng-Elar stretch takes another 4 hours. Normally the trip is carried out over two days as people choose to stay overnight in Ruteng rather than traveling overnight to Lengko Elar. If the road between Pota and Elar were upgraded to Telford or aggregate, it would take only three hours to travel directly to Lengko Elar.⁸

Increased costs for transport companies...

For transport companies, poor road conditions dramatically increase their costs for fuel and vehicle maintenance. Local transportation companies report that the average life of a vehicle in

Table 3: Travel times for comparable distances in Java and Manggarai

Travel Time Comparisons		
Java	Manggarai	Notes
Jakarta-Bandung Distance: 128 km Time: 1.5 hours Km/hour: 85	Ruteng-Labuanbajo Distance: 140 km Time: 3.5-4 hours Km/hour: 35-40	The road from Ruteng to Labuan Bajo is mostly classified as National Road
Manggarai national road	Manggarai District road	Notes
Ruteng to Palembang Distance: 40 km Time: 1 hour Km/hour: 40	Ruteng to Lempanpaji Distance: 104 km Time: 8 hours Km/hour: 13 Ruteng – Borik Distance: 130 km Time: 6 hours Km/hour: 21	Vehicles are only able to travel at an average of 40 km/hour on the best road in Manggarai and an average of just 13 km/hour on one of the worst

Manggarai is only 5 years⁹, whereas the same vehicle in Java would last for 10 years without the need for significant repairs.

One large transport business owner stated that his trucks consume around one liter per kilometer on the roads in Manggarai, but only one liter for every four kilometers when traveling in Java. Increasing fuel prices mean that this difference has a strong impact on transport companies' profit margins.

Transport companies' profits are further reduced in Manggarai due to the effect road conditions have on maximum safe load limits. In Java, because road conditions are on average better, trucks can take about 17 tons of goods in one load. Poor road conditions in Manggarai limit the maximum safe load of

vehicles to around 12 tons and therefore the amount of profit a company can make from each trip.

Poor road conditions also raise costs for public transport operators. The government sets rates for public transport; however, transport operators and drivers often raise these fees illegally because they would otherwise make no profit. Firms are able to do this in rural Manggarai because transport users have no alternatives.¹⁰ For goods transportation the fee is set by the transport operator and varies depending on distance, the type of goods being transported and the time it takes to transport. Due to low local demand and ability to pay for most users, many routes remain unprofitable. Some farmers are so desperate to save money that they will carry their

⁸ Interview with DelSos representative

⁹ Interviews with transportation companies, Ruteng and Cibal, August 31 and September 01, 2005

¹⁰ Information from field trip interviews, Cibal and Sambi Rampas, 01-02 September, 2005

produce on their back in a passenger transport vehicle rather than pay the additional cost of transporting their goods separately.¹¹

The effect of increased travel time, and increased maintenance costs is a decrease in profits to the transport industry and increase travel time and cost for farmers, intermediary traders and businesses. Increased cost of transport and time in turn, negatively impact upon farmers, intermediary traders, and businesses.

Other impacts of poor infrastructure on SMEs...

Poor infrastructure not only increases time and cost. It also has secondary effect on the sorts of activities businesses can conduct. For example, the unreliability of the road infrastructure affects the timeliness of delivery, precluding higher value activities, such as production for supermarket value chains. Similarly, poor road conditions and the high cost of transport mean local businesses are unable to fulfill their need for raw materials in a timely manner.

Long travel times mean that produce is more likely to be damaged enroute, and as a result, farmers sometimes harvest too early to ensure freshness. This reduces the quality of the produce they are able to supply again limiting their ability to participate in higher value activities.

Moreover, as the literature shows (Janvry et al, 1991), high transaction costs can result in some markets failing entirely. Beyond a certain cost, it is simply not worth suppliers reaching into more remote or difficult to reach areas. For example, both farmers and the non-farm sector suffer as producers of agricultural inputs are unable or unwilling to transport production inputs such as fertilizers to rural areas, and productivity suffers as a result.

Even where suppliers do exist, markets are often very small. This tends to limit the number of competitors, giving rise to complaints of collusion and oligopolistic practices. Farmers and businesses in Manggarai complain that large businesses in urban areas are able to create an oligopoly to control prices of the goods that they produce and consume. Their weak bargaining position is exacerbated by lengthy travel times. For example, when farmers take their goods directly to market, they are often forced to leave in the middle of the night in order to arrive in the nearest major town in time to sell their produce and return home. Buyers in town often wait until the buses are about to return to the villages and offering much lower than regular prices to the farmers, who are forced to sell or bear the additional cost of staying overnight in the city.

¹¹ Interview with Delsos representative, Gorgonius D Bajang, 30 August 2005

What happens when roads are improved?

The main road through Sambi Rambas sub-district is the national road running from Ruteng to Bejawa. Villages within this sub-district must first meet the main road via the district road system. In Satarnawang village, the Swiss Intercooperation project funded the construction of a Telford road of 10 km in 1998-1999. The road, built with local community involvement, had a strong impact on socio-economic development in the village.

It used to take about six hours to travel to Ruteng during the dry season and ten hours during the wet season. Because the road was made of soil, often vehicles would become stuck during the wet season and have to wait overnight for repairs or towage. There were only two vehicles regularly servicing passengers to and from the area- "wooden buses" - a truck fitted with chairs and covered with an awning. The bus was unable to enter the village, so produce was carried on foot or taken by horse 35 km to the nearest bus stop in Bealaing.

The nearest health facility at the time consisted of a public health centre (Puskesmas) in the next village, Lengkoajang. Because of the distance, most people chose to receive treatment from a traditional health practitioner (dukun), resulting in lower quality care. There was no senior high school, so students had to travel to the sub-district capital for higher education. Due to the cost of transport, and the time away from agricultural activities, many children would drop out before high school.

Since the Telford road was built, and subsequently asphalted by the government in 1999, it now takes 3 hours to travel from Satarnawang to Ruteng and there is year-round access. Farmers and intermediary traders are able to make the round trip in one day. Now, more than 30 buses cover the route, and 25 of these are owned by local businesspeople.

As the new road became a hub for trade, locals began moving their houses and businesses closer to it, or opened new businesses, in order to take advantage of the increased market. Farmers are now less reliant on intermediary traders as they are able to sell their crops directly to traders in Ruteng and return home in one day. This both improves profits for farmers, and reduces the cost of raw materials for businesses in the district capital. The increase in farmers' profits means they are now able to buy more household goods and modern agricultural inputs, which in turn supports growth in the off-farm sector.

The secondary impacts included improved education and health facilities. Now local people are able to go to Ruteng for serious illnesses and a new Puskesmas opened in the area partly due to its improved accessibility. A Senior High School was built in 1996 just as the road project was completed; the road was one of the reasons why this location was chosen. Due to increased services, and the presence of new teachers and students from neighboring villages, Satarnawang also experienced an increase in demand for other services such as boarding houses, and land prices in the area increased.

WHY ARE ROAD CONDITIONS SO BAD?

Insufficient Funding for Roads?

The road budget for the district, including for maintenance, comes from the District Budget (APBD).¹² The DAU (Dana Alokasi Umum – General Allocation Grant) is the most important source of sub-national revenues in Indonesia. The 2004 DAU transfer to Manggarai was Rp. 173.15 billion and accounted for 86% of total revenues.

National roads are funded directly by central government through a Special Allocation Fund or DAK. Authority for provincial roads lies with the provincial government, and maintenance of these roads is funded by the APBD1 or the provincial budget. In 2004, Manggarai received Rp. 3.48 billion in DAK specifically for roads under national and provincial government authority. Local authorities are satisfied that funding for national road maintenance is sufficient, however, they claim that funding for provincial roads is not yet adequate for the district's needs.

Table 4 outlines budget sources for Manggarai and allocations for development and routine expenditure, including roads.

	Total APBD	Development Spending	Roads Budget (Part of Development Spending)	Development Spending Minus Road Budget	Routine Spending	Civil Servants Salaries (Part of Routine)	Routine Minus Civil Servants Salaries
1999	70.30	11.73	0.42	11.31	58.58	0.00	58.58
2000	76.51	18.38	3.01	15.36	58.13	52.61	5.52
2001	220.85	87.96	17.01	70.95	132.89	108.98	23.90
2002	238.03	61.06	10.33	50.73	176.97	142.53	34.44
2003	287.01	147.78	27.55	120.23	176.84	130.51	46.33
2004	224.32	71.91	6.23	65.68	0.00	0.00	0.00
2005	260.21	110.64	19.06	91.58	160.05	125.83	34.22

All figures in billions of Rupiah

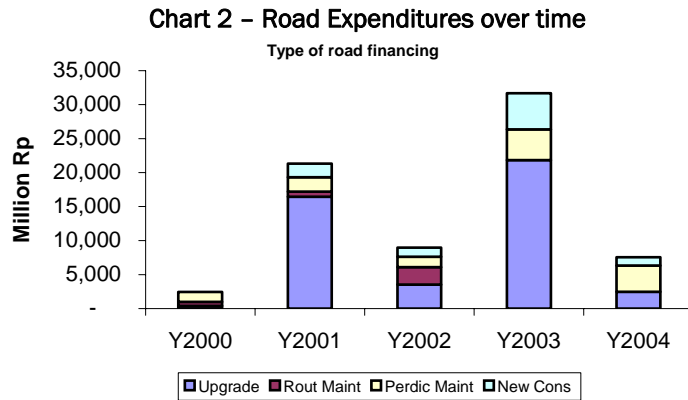
The district government considers lack of DAU to be the biggest limitation to its ability to maintain roads. It asserts that the DAU should be more heavily weighted on poverty level and land size, and if it were that Manggarai would be better equipped to deal with its development needs. It is fair to say that DAU calculation does not have a strong equalizing effect between rich and poor districts. The largest part of the calculation, 62% is based on the size of the civil service in a given district. Only 4% is allocated based on poverty depth, and 4% on total land size. Having said this, however, post-decentralization transfers are on average higher than those prior to decentralization were, and road conditions have declined during this period. In addition, increases in the DAU would not necessarily be used to fund road development. Given that on average 6% of the budget has been allocated to roads in the past 5 years¹³, this would mean for every additional Rp. 1bil (USD 100,000) allocated through the DAU, the maximum increase we could expect to the road budget would be only Rp. 55.3 mil (USD 5,530) would be allocated to roads.

¹² APBD2 (District budget), a general pool of funds that combines the DAU (Dana Alokasi Umum – the general-purpose equalization transfer from central government), national and provincial DAK (Dana Alokasi Khusus - Special Allocation Funds), and District own revenues.

¹³ Road budget as percentage of APBD 1999-2005

A focus on (expensive) upgrading to asphalt rather than (inexpensive) maintenance

A further reason why district roads are so bad is that expenditure is heavily biased towards the construction of new roads and the upgrading (asphalting) of existing roads, rather than routine and period maintenance. In 2004, 62% (Rp 3.9billion) of the road budget was allocated to upgrading roads to asphalt while only 23% (Rp 1.4 billion) was spent on periodic and routine maintenance. The total maintenance bill covered only 33km of routine maintenance. The final 15% (or Rp 0.9 Billion) was spent on new road construction.



Road maintenance does not gain a lot of political support locally as it predominantly involves cleaning gutters and patching holes, as opposed to a highly visible new asphalt road, which has an immediate and visible impact. As a result, even though it is cheaper and sometimes preferable to upgrade soil roads to Telford or aggregate, the government focuses most of the budget on asphalt roads as it has a greater political impact. In some cases, it is technically

necessary to build or upgrade to asphalted road due to the amount of traffic and vehicle loads that pass by. In other cases, however, Telford or aggregate roads are sufficient to ensure access. The tendency to upgrade to asphalted roads is because they are considered more “modern” than the alternatives.¹⁴ In addition, local contractors favor large, materials-intensive projects. It is difficult for contractors to reap large benefits from Telford roads, as they have smaller budgets, are time consuming to build and rely on labor-intensive methods.

It costs between Rp. 250 and 750 million per kilometer to upgrade to asphalted or hotmix road, but only Rp. 10 to 75 million per kilometer to perform routine maintenance on an existing road. Table 5 shows the cost of constructing and maintaining different types of roads.

Table 5 - Road Building/Maintenance Rp millions/km

Surface Type	Routine	Periodic	Upgrade	New
Dirt	10	50	70	100
Telford - Width 3.5m plus bridges, drains etc.	15	75	105	150
Penetration asphalt	25	125	175	250
Asphalt hotmix - Width 3.5 m (village-kec)	45	225	315	450
Asphalt hotmix - Width 6 m (kec-kab)	-	-	-	750

Source: Kimpraswil Manggarai

The difference in the costs of upgrading versus maintaining existing roads is dramatic. It would cost around 223.5 billion Rupiah to upgrade all soil roads in Manggarai to asphalt and another 218.3 billion to upgrade all the Telford roads. Periodic and routine maintenance of all roads in Manggarai would cost around Rp. 157.6 billion in the first year and 26.5 billion in subsequent years keeping all other variables fixed.¹⁵ Given the current budget allocation to road building and maintenance of Rp. 19.06 billion, it would take a period of 23 years to upgrade all Telford and soil roads to asphalt. During this time, however, all roads would continue to require routine and

¹⁴ Mentioned in interviews with DPRD members, Kimpraswil and Bappeda staff

¹⁵ Estimate based on Kimpraswil standard upgrading and maintenance costs, the percentage of each type of road in the district and its current condition.

periodic maintenance, which becomes increasingly expensive if not carried out on a routine basis. By contrast, If the same budget were used to upgrade all soil roads to Telford or aggregate, it would cost just 74.5 billion and take only four years in terms of the budget currently available.

Failure to invest more in maintenance also has a major financial cost. Technical specifications dictate that routine maintenance should be carried out each year for the first five years of a new or upgraded road, costing between Rp. 25 and 75 million per kilometer depending on the type of road. If routine maintenance is carried out each year, the road will only require periodic maintenance in the fifth year and then can be maintained for another five years before requiring an upgrade. If the road is not maintained regularly, however, it will only last two years in a good condition before falling into the poor or very poor category. It will then require periodic maintenance which if again not maintained will require an upgrade within another 2 years. Thus, the overall cost of failing to maintain roads is high.

Table 6: Detailed Budget Allocation for Road Construction and Maintenance*

Year	Upgrade	Routine Maintenance	Periodic Maintenance	New Construction	Total
2000	0.40	0.57	1.47	-	2.44
2001	16.45	0.77	2.10	2.01	21.32
2002	3.52	2.56	1.54	1.33	8.96
2003	21.82	-	4.53	5.31	31.66
2004	2.48	-	3.83	1.23	7.53
Total	44.67	3.90	13.46	9.88	71.91
Average	8.93	0.78	2.69	1.98	14.38
6%	62.12	5.42	18.72	13.74	

Source: APBD Manggarai, 2000-2004 *In billions of Rupiah

Taking a one kilometer stretch of road as an example, the following three scenarios present the long-term costs to the government in maintaining this road:

Table 7: Calculation of Maintenance Costs and the Cost of Failing to Maintain Roads

Year	Scenario 1: Routine maintenance of asphalt			Scenario 2: No routine maintenance of asphalt			Scenario 3: Upgrade to Telford road with routine maintenance		
	Activity	Cost**	Accum. Cost	Activity	Cost	Accum. Cost	Activity	Cost	Accum. Cost
1	Building*	450	450	Building*	450	450	Building*	150	150
2	Routine Maintenance	45	495	-	-	450	Routine Maintenance	15	165
3	Routine Maintenance	45	540	Periodic maintenance	225	675	Routine Maintenance	15	180
4	Routine Maintenance	45	585	-	-	675	Routine Maintenance	15	195
5	Periodic maintenance	225	810	Upgrade	315	990	Periodic maintenance	75	270
6	Routine Maintenance	45	855	-	-	990	Routine Maintenance	15	285
7	Routine Maintenance	45	900	Periodic maintenance	225	1,215	Routine Maintenance	15	300
8	Routine Maintenance	45	945	-	-	1,215	Routine Maintenance	15	315
9	Routine Maintenance	45	990	Upgrade	315	1,530	Routine Maintenance	15	330
10	Upgrade	315	1,305	-	-	1,530	Upgrade	105	435

* 3.5m width asphalt Hotmix, **Millions of Rupiah. Source: based on Kimpraswil Manggarai costing for new roads and maintenance by surface, and maintenance requirements over time

In scenario one, an asphalt road is constructed and maintained regularly, while in scenario two it is not maintained regularly. In scenario three, a Telford road is constructed and maintained

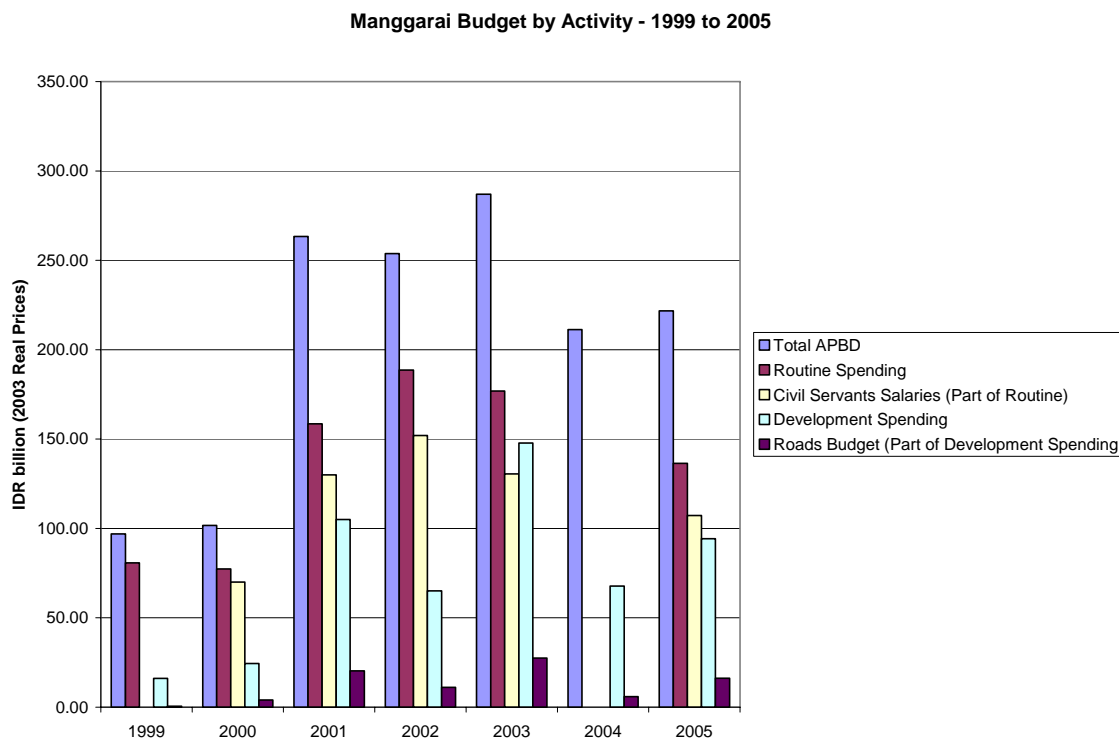
regularly. The cost differences are striking; upgrading and maintaining a Telford road costs only Rp 435 million over a ten-year period compared to Rp 1,530 million for the construction of 1km of asphalt road, which is then not maintained regularly.

As the Manggarai government is responsible for approximately 517 kilometers of asphalt road, failure to carry out essential routine maintenance could cost it almost Rp. 12 billion¹⁶, or 63% of the current road budget, each year in the long term.

Most Spending on the Civil Service

Due to the nature of budgeting at the local level, roads must compete for funding with all other development spending, and with routine spending, the majority of which is allocated to civil service salaries. In 2005, the district government allocated just 7% of the total budget, or Rp. 19.06 billion to roads. This is compared to the national allocation of 10%, which in itself is considered low by international standards (World Bank, 2004). In the same year, Rp. 160.05 billion was allocated for routine spending, with Rp. 125.83 billion or 62% of this allocated to paying civil servants' salaries.

Chart 3 - Manggarai Routine and Development Budget



Source: Manggarai Dalam Angka, 1999-2005 (Nominal Expenditures)

As is the case with many districts in Indonesia, Manggarai has a large bureaucracy with 36 government agencies. Many departments have overlapping authority, such as Bappeda and the various Litbang (Research and Development units in each technical department), which are both responsible for researching development needs. The department of Trade and Industry has overlapping duties with the department of Cooperatives, Small and Medium Business as they are

¹⁶ The difference in cost between scenarios one and two

both focused on supporting the same sector of the economy. Some local government departments have little to do— the BKPMD, the Regional Investment Board, handles a very small amount of investment each year, a duty that could be integrated into another department’s authority. For more detail regarding government departments and options for consolidation, see Annex 2.

Since decentralization, a few districts have been able to reduce administrative spending by amalgamating departments where appropriate and eliminating others that had no logical function in the district. One is Jembrana District, in which the government reduced its seventeen departments to ten through consolidation. Whilst civil service consolidation can help local governments to rationalize spending, it is not an easy reform, as it tends to receive strong opposition from senior civil servants.

Raising local revenues to fund local roads

The district government is limited on how it can raise additional revenues to finance local expenditures. Although decentralization saw the majority of responsibility for roads transferred to the district level, authority to collect revenues from road-users still lies with the central and provincial governments. Central government collects taxes on vehicle imports and luxury sales tax on spare parts, while the provinces collect taxes on vehicle acquisition, motor vehicle ownership transfer fees and the annual motor vehicle tax as well as taxes on vehicle operation such as the fuel tax.

The district government collects fees at two district border posts, and at the Reok port; however, these fees are small and are only charged to companies transporting goods in and out of the district rather than within the district. There is a weighbridge at the Reok port; however, according to local government sources the weighbridge is broken. This means that officials in charge of collecting fees must estimate the load weight, a process that is open to corruption. Fees collected are channeled into the APBD as part of the total regional revenues and therefore are not earmarked for road maintenance. As a result, businesspeople consider the fees a nuisance, as they do not get any direct benefit from them.¹⁷

Revenues collected by the provinces are shared with the district; however, there is no differentiation between road-user charges and other revenues, so ultimately these funds are absorbed into the overall budget. This is particularly a problem in terms of road maintenance, as road-users are not held directly responsible for maintenance due to the damage their vehicles cause to roads and local governments cannot be held accountable for maintenance based on a known source of revenue. Links between the costs imposed by road-users in terms of damage to the roads, and the funds available for road maintenance would be beneficial in two ways. Road-users would have a direct incentive to minimize the use of more damaging forms of transport, and the funds available for road maintenance would be directly related to the damage caused to roads, thereby ensuring adequate funds are available for the preservation of the network.

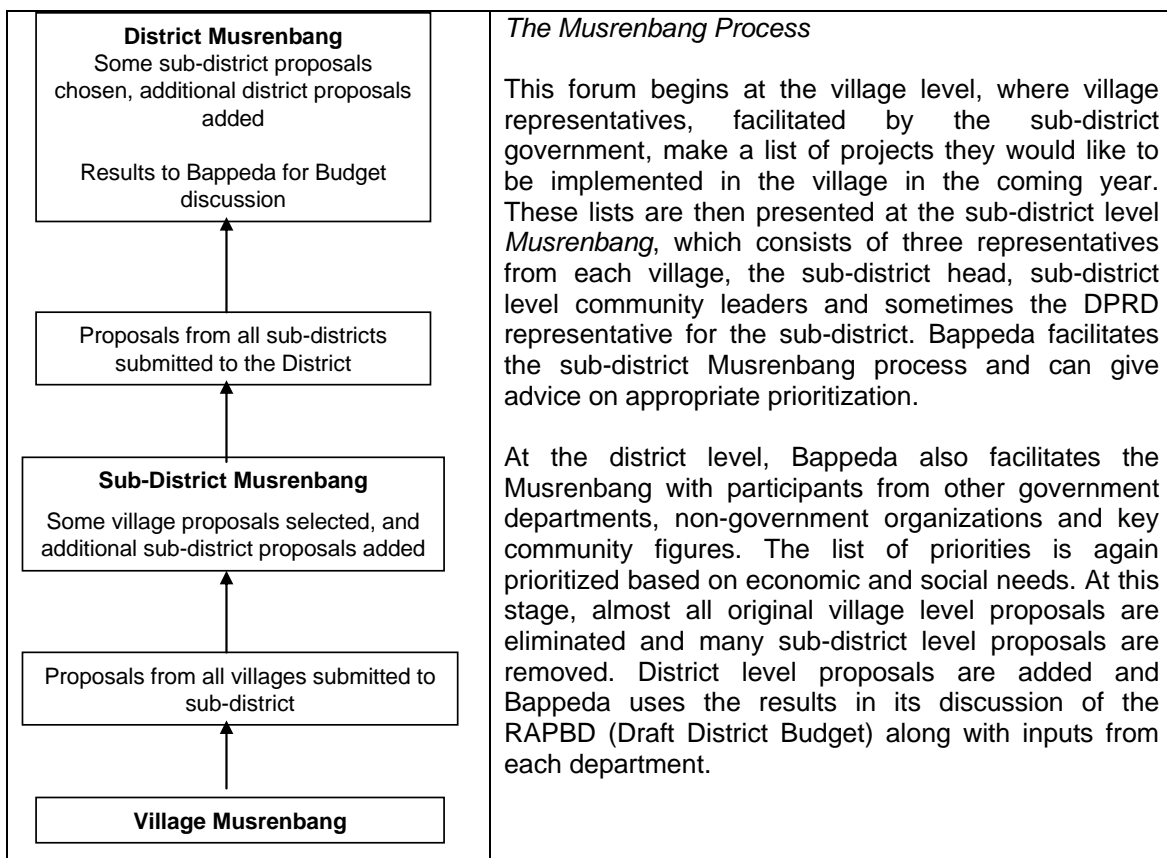
HOW FUNDS ARE SPENT—THE ROAD BUDGET ALLOCATION PROCESS

Why does there appear to be a bias in favor of building new asphalt roads and upgrading roads to asphalt rather than maintaining existing roads and building cheaper roads? One reason is the nature of the budget allocation process. Allocation of the development budget is based on two separate processes. The first is a participatory bottom-up process of discussion from the village to the district level called the Musrenbang. The second is a series of technical studies carried out by each government department, based on their area of authority. For roads, Kimpraswil, Bappeda and the Regional Secretariat carry out this feasibility study.

¹⁷ FGD

According to Bappeda, it is in the Musrenbang that the problem of excessive emphasis on network expansion rather than maintenance is most pronounced. The majority of village and sub-district road proposals are for a new or upgraded road and not simply for maintenance of existing roads. Although the Musrenbang is supposed to be a participatory process, in reality only the most outspoken people participate and most see the results as a “wish list” from village and sub-district heads. During the Musrenbang process the findings of the feasibility study, which is carried out concurrently, are not utilized to decide on development priorities and most Musrenbang participants lack the technical skills to make decisions based on economic or social benefit to the community. Proposals are therefore made by local elites, without information that would help participants to understand the tradeoffs between building new roads and maintaining existing roads.

New road building is usually given priority in both the sub-district and district level Musrenbang. Village and sub-district proposals tend to be dropped because they are not in line with district priorities such as main arterial roads. Limited budget means that the government will tend to focus on big impact projects.



The Feasibility Study

The last comprehensive study of strategic roads took place in Manggarai over 10 years ago.¹⁸ No current data is available at the local level to show which roads are of economic significance, why they are of significance, or the condition of economically significant roads. The local government claims to have knowledge of the road system from anecdotal evidence. Decisions on road development and maintenance are made without reference to actual demand.

¹⁸ Interview with Bappeda

The second process, which runs parallel to the Musrenbang process, is the annual Feasibility Study, which is regulated by a national directive from PU (write out), SK #77. Bappeda with Kimpraswil and the Regional Secretariat carries out this study, which focuses on costing pre-selected roads for upgrade, maintenance or new construction. The study team consists of three technical experts who examine the physical condition of the roads and analyze local economic and development needs. They then prioritize roads in the assessment based on the estimated budget. This prioritization takes into account the economic benefit of improving or building a new road, the size of the population and poverty level and regional development issues such as opening up isolated areas with economic potential. Technical issues such as the amount of traffic that will use the road and the difficulty of building based on topography are also considered.

Funding for the feasibility study only covers a partial study of the district; however, and as a result, the team has to prioritize which areas will be studied prior to going to the field. Its prioritization is based on instructions from the Regent and existing knowledge of the district. The priorities for road building and maintenance are based broadly on economic hubs, such as centers of coffee or vanilla production, roads that link sub-district towns to the district capital and isolated areas that should be opened up. This year the study team received Rp. 25 million from the central government Department of Public Works with which they were able to study 28 lengths of road.

The Draft Budget

Once the feasibility study and Musrenbang process are complete, the government decides which of the proposed projects will be included in the draft budget. Bappeda and Kimpraswil staff claimed that the feasibility study is weighted higher in terms of importance to the draft budget than Musrenbang proposals. The stated reason for this is that the Musrenbang proposals tend to focus on building new roads rather than carrying out routine maintenance and repairs. Critics argue that the decision is based predominantly on the Regent's preferences or on where important members of the government live.

The Regent has several opportunities to influence budget allocation including indicating where the feasibility study should be carried out, participating in the Musrenbang process, and approval of the draft district budget. Due to the cost of the direct election process, the Regent enters his post indebted to many interest groups and individuals in terms of their financial support for his election rumored to be around Rp. 3-4 billion. Several respondents mentioned that the Regent would now be bound to ensure projects are implemented in areas that will directly benefit his supporters. Some critics also mentioned that previous Regents have tended to direct funds toward projects in their place of birth or residence.

The Budget Agreement

Once the government completes the draft budget it is then submitted to the DPRD for its approval. DPRD budget committee members decide on the budget, taking into account Musrenbang results in their respective constituent sub-districts. They do not utilize the results of the feasibility study, however, and therefore have to rely on their own judgment when it comes to development proposals.

Both government and non-government critics alike claim that DPRD members change the budget based on their own personal and political interests and that the roads system suffers as a result. At least one quarter of all current DPRD members are contractors, and as a result, it would be in their interest to divert funds from routine maintenance activities to building new roads. Though DPRD members are not allowed to take on any government contracts during their tenure, several respondents also believed that they were able to do so by placing their businesses under different management during their time in office. DPRD members, like the Bupati, are often bound politically and financially to businesspeople that supported their election, and as a result

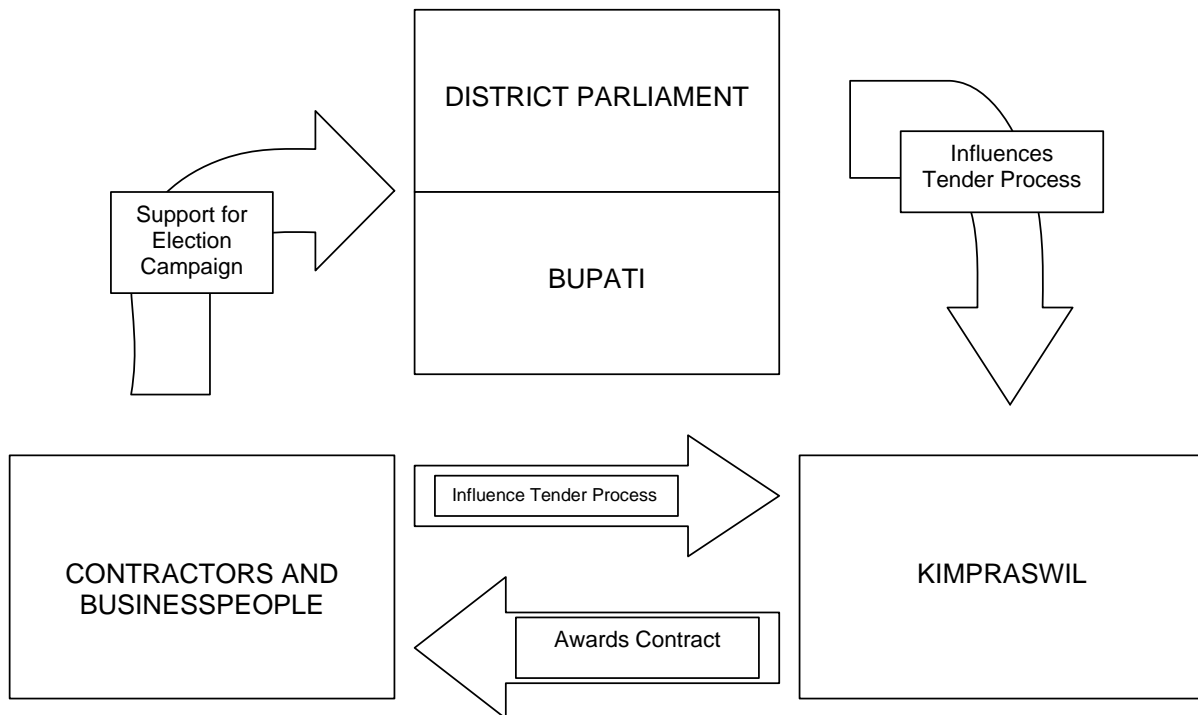
feel obliged to ensure certain projects are carried out. Some also believe that DPRD members are influenced by bribes from the Regent and other members of the executive.

Conversely, the DPRD asserts that it is a representative body and therefore has the right to ensure regional development represents public interests. This could result, quite naturally, in DPRD members focusing on providing roughly equal benefits to most parts of the district to satisfy their constituents, while not focusing strongly on strategic significance and/or economic viability. As a result, the DPRD prioritizes building new roads to expand the road network, drawing money away from routine maintenance, and therefore participating in a process that results in poor maintenance of all roads.

Collusion Leads to Poor Road Conditions

Finally, many respondents contended that collusion in the tender process and subsequent poor quality road building results in poor road conditions. The key players in Manggarai have strong incentives to engage in collusion at present. Kimpraswil runs the tender process, and has a great deal of power in terms of determining project allocation, and monitoring project implementation. Many observers expressed the view that contractors are able to influence Kimpraswil staff in order to obtain projects. Several DPRD members are also contractors, and although they cannot legally participate in government projects, they may still be able to influence the process.

Many respondents argued that the Regent has a direct hand in the decision about which contractors win certain projects. It was alleged that contractors were the main supporters of the Regent's election campaign, which cost Rp 3-4 billion, and that he therefore has an interest in deciding which contractors are chosen for government projects, and in ensuring that there are sufficient construction projects for all his supporters.



In fact, direct elections in the district may have increased incentives for key players to engage in collusion. Now, both DPRD members and the Regent must raise money and political support on a regular basis for their election campaigns. Therefore, collusion in road building begin well before the planning and budgeting process begins, with contractors supporting particular candidates for government office.

In addition, there may be collusion in the tender process since there are strong incentives for local contractors to collaborate with each other and those procuring government roads projects to maximize their profits. Respondents heavily criticized the tender process because it tends to focus on obtaining the cheapest offer for the project, rather than considering the contractor's ability to provide a good road for a reasonable price. Previously the government kept a list of contractors, which categorized them based on their ability to carry out certain types of projects. Contractors were only allowed to bid for a project if they had the appropriate technical capacity. With Keppres 80/2003, however, the tender process is now open to all proposals. While in principle this has increased transparency, the open tender process, combined with collusion, may have actually resulted in unqualified contractors winning government projects.

Some contractors are also accused of skimping on materials during construction to increase their profits. A 1cm reduction in the asphalt layer of a 6m wide road is equal to Rp. 34 million per kilometer¹⁹. As a result, the road will only be able to sustain 70% of its traffic load in its service life (10 years). Poor quality construction, lack of regular maintenance, and overloaded vehicles can often result in roads degrading in as little as five years.

Kimpraswil is also charged with monitoring all government-funded roads projects, and it hires consultants to carry out this task. However, it usually carries out monitoring only when the road is almost complete, or complete, and therefore can no longer affect the outcome of the project. It is rumored that monitoring consultants and members of the government can be influenced by contractors so that they will ignore any abnormalities in the project.²⁰

¹⁹ Assuming current price of Rp.200,000 per ton. Figures from Gadjah Mada University Research Institute, 2005

²⁰ Various anonymous sources

CONCLUSIONS

Roads in Mangarai are in relatively poor shape and evidence indicates that the road network has been degrading in recent years. This is having a negative impact on local firms and communities and the local investment climate. The immediate causes for these problems include lack of funding, inappropriate priorities resulting in a lack of maintenance and expensive upgrading techniques. However, the underlying problem is that the incentives for most stakeholders in Mangarai are to act in ways which result in a poor-condition, badly maintained road network.

The district Regent and members of parliament must raise money for their election campaigns, and public works projects are a traditional source of funding, both in terms of extra payments from contractors to secure bids, and the goodwill and presumed financial and political support that these contractors will provide in future election campaigns. Large, materials-intensive trunk roads are most likely to generate extra benefits to all parties, and not surprisingly, more likely to get built. Labor-intensive roads and/or maintenance of existing roads generates fewer benefits. In addition, building expensive roads in scattered locations has the added advantage of responding to community demands, as expressed through the *Musrenbang* process by spreading the benefits of road construction to many localities.

Kimpraswil staff responsible for procurement and monitoring of road construction, face similar incentive problems. While its staff should be neutral and simply implement the results of the planning and budgeting process, they may be given strong incentives, in the form of payments from contractors, to ensure that they do not monitor construction quality too closely.

Local contractors also face incentives to build materials and cost-intensive roads. These tend to have larger budgets thereby generating greater income. They also have the potential to provide additional income in the form of savings through skimping construction materials. These contractors also face pressure to offer payments to secure future business.

Even communities face dysfunctional incentives, since most communities want new, high-quality roads. They both insert these requests into the *Musrenbang* process, and also lobby their DPRD representatives informally. These demands for high quality roads, though impossible to meet throughout the district, offer another incentive for political representatives to prioritize construction of them in at least a few places.

What steps might the central, provincial and local government take to change these incentives and provide for better district roads?

More Funds for Roads with More Accountability

Transfer authority for existing central and provincial government, road-user charges to district governments and allow district governments to charge fees to road-users for the service they receive. By thinking of road maintenance as a commercial service, rather than a public good, local governments can create a new revenue stream for construction and maintenance directly related to the costs users impose on the network. Current district road-user charges for vehicles entering and leaving the district should be abolished as they contravene the free movement of goods. However, weighbridges should be renovated and modernized to ensure that charges are related to the costs imposed by load weight and monitoring should be introduced to ensure that such charges are non-negotiable. Trials could also be carried out as to the feasibility of taxing public transport providers, in return for improving and maintaining roads with the revenues raised.

Free up funds by consolidating local departments with similar roles to achieve significant budget savings and increase efficiency. The district government could undertake a study to identify departments with overlapping responsibilities and recommend consolidation, and by using the experience of other districts that have carried out bureaucratic reform of this kind. In addition, the

central government could support measures to rationalize local bureaucracies by providing incentives such as cash grants for development for local governments that reduce spending on their administration. The central government could theoretically divert funds that would be saved as part of the DAU calculation for the local civil service to finance these grants.

Improve the Way that Funds are Allocated and Monitored

More spending on routine and periodic maintenance is key to ensuring good road conditions in the long-term. Both Bappeda and Kimpraswil can play a part in quantifying and socializing the relative cost-effectiveness of road maintenance, compared to the cost of building new roads and/or upgrading existing ones, and in ensuring that local citizens and leaders are aware of the tradeoffs between these two approaches.

Implement a block grant system to villages or sub-districts for maintenance and construction of smaller feeder roads. This type of system has been effectively used in the national Urban Poverty Project and the Sub-district Development Program (KDP) to enable local people to improve basic infrastructure. Experience has shown that community-managed infrastructure projects can, with appropriate facilitation, be both significantly cheaper and better-maintained than top-down projects implemented by government.

Coordinate the parallel Musrenbang and technical planning exercises to ensure that both are taken into account when budget allocations are made for roads. This would require completing a comprehensive feasibility and needs study, and sharing the results of this study with those who are participating in community planning processes. Key would be to inject technical expertise into the debates on prioritization at each level while leaving communities to choose between feasible options based on their own development priorities.

Use more cost effective road construction and maintenance methods to reduce spending on the construction of new village and sub-district level roads, and focus on the maintenance and cost-effective upgrading of existing roads. Undertake a comprehensive study of road usage, and calculate the costs and future benefits of maintaining and/or upgrading existing sections. Specifically, a future strategy could include less spending on upgrading of roads with asphalt and more focus on local feeder roads that could be constructed using local labor particularly in remote localities that have limited road usage. One way of boosting this approach would be to reserve a special and substantial allocation for community labor-based road construction.

Tackle Collusion

This is the most intractable of problems, but it must be addressed. One way of doing this would be to require and enforce public disclosure of campaign contributions. Similarly increasing the transparency of the tendering process would make it more difficult for sub-standard bids to be accepted. The introduction of independent third party monitoring of the condition of road construction with associated penalties would complement the introduction of service contracts by providing an incentive to contractors not to build sub-standard roads.

Reduce incentives for collusion by tying future roads payments to construction quality. Create incentives for Kimpraswil to reduce collusion in procurement, implementation and monitoring of roads projects by the greater use of outcome and service based contracts. Such contracts link disbursements to the delivery of a stream of infrastructure services over a longer period of time, rather than the mere construction of a road. In this way contractors are given an incentive to build roads that last since their payments depend on the road condition over a longer period of time. In addition it creates an incentive to undertake maintenance to ensure future service quality.

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