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**Using Micro-Enterprises to Create Local Contracting Capacity
- The Latin American Experience in Road Maintenance -**

By
Dr. Gunter Zietlow
German Development Cooperation (GTZ)

E-mail: Gunter.Zietlow@gtz.de
Internet: <http://www.zietlow.com>

1. Introduction

In the late 1980's and early 90's many countries in Latin American started to use private contractors for routine maintenance of roads instead of the agency's own staff. The move was part of an overall reform process to modernize the public sector and to foster the use of the private sector. The main driving force was to save cost and improve road conditions at the same time. Actual road conditions did improve and substantial **cost savings of between 20% and 50%** of average unit cost have been experienced. By now the majority of routine maintenance activities are being performed by private contractors, at least on the national road networks in Latin America.



Cooperative micro-enterprise in action in Honduras

This process wasn't always without problems. Especially agency staff supported by trade unions often objected heavily. But most road agencies had little choice in the wake of constantly diminishing road maintenance budgets.

Colombia was one of the countries, which spearheaded the reform process. Consequently, it was the first country to make contracting out of road maintenance obligatory for the national road network

by law in 1994. Colombia also pioneered the creation of micro-enterprises for road maintenance back in 1984. With the help of the United Nations Development Program (UNDP) and the International Labor Organization (ILO) the Ministry of Transport initiated a program to form **cooperative micro-enterprises for road maintenance** to improve the maintenance on the national road network and to create jobs for the people with no or little formal education or training living alongside these roads. The system was and still is highly successful and serves as a model for many other countries in Latin America.

2. Types of Micro-Enterprises

Basically, there are two different types of micro-enterprises: (a) the **cooperative** form as mentioned above, where each member of the cooperative has equal rights

and obligations; and (b) the **single owner** enterprise who employs labor to perform the maintenance activities. Both types are present in Latin America.

Colombia, Nicaragua, Venezuela, Honduras, Ecuador, and Bolivia are using the cooperative form, while the single owner micro-enterprise is more common in **Guatemala, Peru and a number of other countries in Latin America**. The reason for countries to have adopted one or the other system is not based on a comparative analysis of the advantages and disadvantages of each system, but rather on tradition or in the way the systems have been promoted by bilateral and international development agencies.

3. Types of Contract Used

Basically, there are two types of contracts:

1. one using **unit rates for work items**, with payments being made according to the quantities of work performed; and
2. the other is based on the achievement of predefined **performance indicators** in exchange of a fixed monthly fee per kilometer of road maintained.

The second type is becoming increasingly popular in Latin America. When Colombia started its program of cooperative micro-enterprises back in 1984, each micro-enterprise had between 11 to 15 members and was given a yearly contract to maintain an average of 40 kilometers of paved roads. The monthly fee was calculated in such a way that each member earned approximately 1.5 times the minimum wage (plus allowances required by law) and allowances for transportation, clothing, and tools. This provided just the right incentive for the cooperatives to make the system succeed. They received training in routine maintenance activities and all fields related to managing a small enterprise such as accounting, management and social skills. Supervision was contracted out to a "road administrator" who acted more like a **road manager**. He not only supervised and continued to train the members of the cooperatives, but also was responsible for planning and supervising works, which were outside the scope of the micro-enterprises -- like major patching and periodic maintenance activities. In the beginning, these contracts described the activities to be performed on a regular bases and called for additional works to be executed upon direction and under the supervision of the road manager. This changed in 1996 when performance-based contracts were introduced, not only for the micro-enterprises, but also for the road managers.

Performance-based contracts, in contrast to unit price contracts, define and measure a final product or the "output" rather than the amount of labor or materials used as input to complete a certain task. The performance criteria primarily define minimum conditions of road, bridge and traffic assets that have to be met by the contractor or the micro-enterprises. If conditions drop below the levels defined in the contract, response times normally define the time periods required to rectify these deficiencies. Typical performance criteria are summarized in Table 1. For micro-

enterprises these performance criteria vary from being very elaborate and strict, as in the case of Uruguay, to being fairly general, ones as in Colombia and Honduras.

Failure to rectify deficiencies in time results in either **deductions** from the monthly fee, or in termination of the contract. For example, most of the routine road maintenance contracts with cooperative micro-enterprises contain a scale of penalties for non-compliance rising from 5%, through 10% to 15% for the first three instances. Thereafter the contract can be terminated. Experience with cooperative micro-enterprises reveals that very few cooperative micro-enterprises had to be terminated due to non-compliance.



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All contracts are either tendered, or let directly. In the case of the **cooperatives all contracts have been let directly** and have not been subject to tender because of the

special nature of arrangement. Most countries allow for relatively low limits on the contract amount, which can be let directly. In such cases it is necessary **to change existing laws** to allow for higher limits to be applied for contracts with road maintenance cooperatives. For example, in Honduras, the limit was such that it allowed the road maintenance cooperatives to be contracted for not more than 6 months. Presently they are using World Bank credits to circumvent this problem until the law can be changed. In the case of Guatemala, which is using single owner micro-enterprises, contracts have been let directly as well, but for a different reason. Their road administration was hard pressed to **reduce staff** and by letting contracts directly it was able to provide a special **incentive for staff to leave** and to take-up these contracts. Initial contract prices were slightly lower than the ones for the road administration performing these activities with their own labor force. When these contracts were exposed to competition, prices dropped by more than 30%. But these prices are still higher than the comparable contracts for road maintenance cooperatives (see Table 1).

Subcontracting is strictly forbidden in all contracts with cooperative micro-enterprises, as this would go against the spirit of such contracts. In addition, subcontracting tends to inflate prices, or lower the quality of work. Comparing the cooperatives in Colombia, Honduras, and Nicaragua with the ones in Guatemala, clearly support this conclusion.

4. Road Maintenance Cooperatives

Especially for smaller countries, which are **lacking local contractor capacity**, or where a few big contracting firms are limiting competition, it is important to create micro-enterprises for road maintenance, either in the form of cooperatives or as single owner enterprises. Experience gained in Latin America suggests that the **cooperative form has several advantages over the single owner micro-enterprise**. Most importantly, the working spirit as well as the quality of work is much better in the case of cooperatives. This might be due to the fact that each member of the cooperative has equal rights and obligations, has been trained to perform well and is coming from the area close to the “their” road. They often take such a pride in their work that they develop a kind of “ownership” towards “their” road.



Repairing a ditch in Ecuador

a) Setting-up road maintenance cooperatives

The process of setting-up such micro-enterprises is fairly straightforward and follows a common pattern, which has been applied in Colombia, Nicaragua, Honduras, Ecuador, and Bolivia.

Basically, there are **4 steps** as follows:

1. **Planning.** This stage consists of drawing up an outline, as well as a detailed program of how, when and where to establish micro-enterprises and the development of a model contract.
2. **Promotion.** During this stage a promoter visits villages along the selected roads, promotes the concept of road maintenance by cooperative micro-enterprises and participates in the process of selecting potential members of these cooperatives.
3. **Creation.** This stage starts with the legal establishment of the cooperative micro-enterprise, contract letting and continues with training programs (for details see Boxes 1 and 2) to enable the cooperative to assume their responsibilities.

4. **Consolidation.** During this phase – which takes approximately one year -- the micro-enterprise receives advice and additional training as required.

Box 1: Typical list of documents forming the contract of a cooperative micro-enterprise for road maintenance

- Legal constitution of the cooperative micro-enterprise
- Contract between the supervisory firm (road manager) and the micro-enterprise
- List of activities to be performed by the micro-enterprise, including performance indicators
- Technical manual for routine road maintenance
- Environmental manual for routine road maintenance with micro-enterprises
- Technical information and inventory of the road under contract
- List of tools

Box 2: Training program for cooperative micro-enterprises

The training program typically contains the following elements:

- How to work as a team.
- Characteristics of a micro-enterprise.
- Problem solving techniques.
- How to make best use of the human, physical, financial, organizational, natural resources at hand.
- Management of the micro-enterprise
 - i. Personnel
 - ii. Production, promotion and sales
 - iii. Service quality
 - iv. Finances
 - v. Administration, organization and planning.
- Road maintenance and road safety.
- Experiences and lessons learnt from setting-up micro-enterprises in other countries.

b) Contract value

Since cooperative micro-enterprises are not subject to a tendering process, it is necessary to determine the monthly payment based on a number of factors such as the minimum wage and allowances for social security, transportation and tools, as well as the number of kilometers of road to be maintained. An example of the factors used to calculate the payment per member of the micro-enterprise in Bolivia can be taken from Box 3.

Box 3: Bolivia: Calculation of the monthly contract value

1. Minimum wage
2. Pension Fund contributions (14,5% of the minimum wage)
3. Personal and third party insurance (10% of the minimum wage)
4. Food allowance
5. Transportation allowance
6. Allowance for tools and safety devices

Administration, contingencies and profit (20%) of the total of wages, social security contributions and the allowance for tools and safety devices

In order to determine the amount of labor necessary to maintain a certain section of road, a **road classification model** is being used, taking into consideration the characteristics of the road, topography, climate, and vegetation. Road sections with a difficult road surface, high number of drainage systems, fast growing vegetation and mountainous terrain are assigned to the most labor-intensive category. In the case of Colombia, there are 4 categories, in which the most difficult category requires 0.4 persons per kilometer and the easiest 0.2 persons per kilometer of road.

Typical average routine maintenance costs per kilometer by micro-enterprises cooperatives can be taken from Table 1.

Country	No. of contracts	Total kilometers	Average kilometers	Duration in years	Average cost per kilometer in USD
Colombia (MEC) national roads	280	11487	41	1	1500
Colombia (MEC) Popayán	5	308	62	1*	1100
Guatemala (ME)	130	4200	32	1*	1500**
Honduras (MEC)	36	1670	46	1	1200
Nicaragua (MEC)	27	1250	46	1	1000
Uruguay (ME)	9	1768	196	2*	3800***

* Renewable for a second term without tender; ** only includes cleaning activities; *** includes road maintenance management, materials and equipment; ME = micro-enterprises; MEC = micro-enterprises cooperatives

c) Performance Indicators

Most of the cooperative micro-enterprises in **Bolivia, Colombia, Ecuador, Honduras, and Nicaragua** are using a kind of performance-based contract. The contract lists the maintenance activities, like patching of potholes, crack sealing, cleaning of drainage pipes or grass cutting, together with the performance indicators for each activity. For example, in the case of patching of potholes, the micro-enterprise is required to inform the road manager about the existence of a pothole and patch the

pothole with the material supplied by the road manager. The performance indicator is that there should be no pothole. An example of the activities and performance indicators used in the contracts in Ecuador are shown in Table 2.

Table 2: Activities and performance indicators for road maintenance micro-enterprises on paved roads	
Activities	Performance Indicators
Cleaning and repairing of culverts and inlets	Culverts and inlets have to be structurally sound and clean to allow for the free flow of water
Cleaning and repairing of surface drainage structures like ditches and channels	Surface drainage systems have to be structurally sound and clean to allow for the free flow of water
Cutting of grass and brush	Vegetation should not exceed a height of 30 cm
Trimming, cutting and removal of trees	No trees should obstruct traffic or pose a safety hazard
Planting of trees and shrub and seeding of grass to control erosion	Compliance with the program to control erosion
Cleaning of roadway and right-of-way	Roadway and right-of-way should be free of litter, debris and road-kill
Patching of potholes in pavement and shoulders	There should be no potholes
Sealing of cracks	Cracks more than 3 mm wide should be sealed
Sealing of joints	Joints have to be sealed
Cleaning of bridge structures	Bridge structures should be clean
Cleaning and painting of bridge railings	Bridge railings should be clean and well painted
Cleaning of riverbeds (small rivers)	Riverbeds have to be clean within 100 meters from the edges of bridges
Removing minor land slides	There should be no obstruction of the roadway
Cleaning of road and traffic signs	Road and traffic signs should be clean
Maintaining of milestones	Milestones should be complete, clean and visible. Missing milestones should be replaced within 24 hours
Cleaning, repairing, and painting of guardrails	Guardrails have to be clean, complete and visible
Cleaning of road markers, road markings, and horizontal road signs	Road markers, road markings and horizontal road signs have to be clean
Responding to emergencies	Responded in due time to emergencies
Removal of billboards	There should be no billboards within the right-of-way
Participate in training activities	Each member of the road maintenance micro-enterprise attends training courses conducted by the road manager or road administration
Note: The micro-enterprise is providing the necessary labor to perform these activities and the road manager is providing materials, paints and equipment.	

d) Form of payment

All micro-enterprises are being paid monthly a **fixed fee** in equal installments. Normally, there is an advance payment of between 10% and 20% of the contract amount. Some countries require certain guarantees while others do not. Contract duration is **one year**. Usually, contracts are extended if the performance is satisfactory. **Penalties** for non-compliance are deducted from monthly payments.

It is extremely important that micro-enterprises are **paid on time**, since they do not have the capital to survive for an extended period of time. Such contracts should be given priority when financial resources are scarce.



Micro-enterprise in Popayán

5. Road Management Enterprises

Road management enterprises are very small enterprises in charge of the management of approximately **200 kilometers of roads**, which includes almost all management activities normally performed by the road administration in relation to road rehabilitation and maintenance **to keep the road in good and safe condition and to satisfy the road user**.

Normally, a road management enterprise is headed by a **professional road engineer** with extensive experience in road construction, rehabilitation, and maintenance and with good management and communication skills. In addition, there is one resident engineer, one or two inspectors, a driver and a secretary.

Activities of the road manager typically include:

- Operate a comprehensive information collection system.
- Conduct studies and prepare documents to keep the road in good and safe condition.
- Plan, program, coordinate, and supervise the road maintenance micro-enterprises as well as other contractors working on the road.
- Conduct training programs for micro-enterprises.
- Respond to emergencies and accidents.
- Maintain good relations with the communities alongside the road.
- Execute programs to control erosions and to protect the environment along the road.

- Assist the road administration in the preparation of the road rehabilitation and maintenance budget related to the roads under his management.

Contracts are subject to public tender, are performance-based and include penalties for non-compliance.

In Colombia, these road management firms are subject to a strict **evaluation and feedback** system. Every 3 months they are required to give a written and oral report with regard of the achievements made and problems encountered. The objectives of these meetings are:

- to evaluate the road management performed by the road management enterprise, based on predefined criteria,
- to learn about the activities performed, the state of the road and bridges, satisfaction of the road users and problems encountered,
- to evaluate and improve the information collection system,
- to evaluate the maintenance activities and to adjust priorities, and
- to improve the management and technical skills of the road engineer.

The **high quality of these road management enterprises has been key to the success** of the maintenance of the national road network of Colombia. Most of the road engineers are former employees of the road administration who have received additional training to prepare them for this job.

6. Small-scale road maintenance enterprises in Uruguay

In 1996, the national road administration of Uruguay started to contract routine road maintenance with the help of the International Road Federation (IRF). Previously, routine road maintenance had all been done by the administration's own staff. The desire or pressure to reduce the number of staff in the road administration facilitated the contracting innovations. **Employees were being encouraged to form micro-enterprises** to undertake routine road maintenance under contract. Initially they formed four companies, two for the maintenance of road signs on approximately 150 kilometers of roads each and two companies to perform routine maintenance activities on paved roads. Contract periods were 2 years with the possibility of renewal for another 2-year period. The peculiarity was that the ex-employees were given the opportunity to reintegrate themselves into the road administration if their



Patching in Uruguay

venture failed. In practice, none of them failed. On the contrary, the scheme was so successful that more staff wanted to take-up contracts than were available.

Existing legislation had to be changed to allow for direct contracting. The road administration provided the necessary equipment on a rental basis and the ex-employees were able to cover the initial guarantees through the severance payments they received from the road administration. In addition, they were given a voucher to pay for training courses to prepare them for managing a company.

Initially, the lump sum contracts were based on a fairly detailed work program. Later on they were transformed to full performance-based contracts. The value of these contracts was 5% below what it would have cost the road administration to do the work in-house. By the end of the year 2001 there were 9 micro-enterprises maintaining 1768 kilometers of the national road network.

7. Lessons Learnt

Except for Colombia, micro-enterprises for routine road maintenance have only recently been introduced in Latin America. Nevertheless, the experiences gained so far allows us to draw some important conclusions:

- **Securing sufficient and timely financing for micro-enterprises is crucial.** These enterprises do not have the ability to survive prolonged delays in payments. The system will simply collapse if the financial resources are not available on time.
- **Micro-enterprises for road maintenance have proved to be a viable option for creating local contracting capacity.** For countries, which lack local contracting capacity for road maintenance, or simply want to create more competition (especially in rural areas), the creation of micro-enterprise has been highly successful.
- **Cooperative micro-enterprises seem to have a distinct edge over single owner enterprises.** Experience shows that the cooperatives have higher work morale and produce better results at lower cost. In addition, cooperatives seem to be less vulnerable to corruption than single owner enterprises.
- **Careful selection of the members of the cooperatives and a well designed and executed training program, is extremely important for these enterprises to succeed.** The extensive experiences gained in Colombia in the selection and training of members of the cooperatives has helped other countries to implement the system of micro-enterprises without major problems.

- **The creation of cooperative micro-enterprises for road maintenance is an excellent way to not only improve road maintenance, but to create employment, especially in remote areas.** To create employment and to improve road maintenance in rural areas in Colombia was the main reason why this program was initiated in the first place. In addition to the direct employment effects, there are indirect ones as well.
- **The creation of micro-enterprises provides an excellent opportunity for road administrations' staff to start their own businesses.** In Guatemala and Uruguay the creation of micro-enterprises for road maintenance allowed the road administrations to reduce its staff and at the same time to offer attractive employment opportunities.
- **The qualification of road management enterprises is crucial to the success of the road maintenance system using micro-enterprises.** Experience shows that there is a fairly good relationship between the quality of the work performed by micro-enterprises and the respective road managers or supervisors.
- **The creation of road maintenance cooperatives has often initiated a process of widening the scope of enterprise activities for the members of the cooperatives as well as for their families.** The training to manage a small business has enabled members of the cooperative to start additional business activities, mostly related to their civil works skills, and even has inspired family members to create small family businesses in other fields.
- **Performance-based contracts seem to produce better results than unit price contracts.** Although no study has been made to compare the two forms of contract for micro-enterprises, observation of existing contracts emphasis the superiority of performance-based contracts with regard to quality and cost.

Micro-enterprises for road maintenance are being introduced in more and more countries in Latin America with great success. International, as well as bilateral assistance, has encourage this development promoting the Colombian expertise as a raw model which has been adapted to the specific situation of each country.

Note: Additional information on micro-enterprises for road maintenance is available on the world-wide-web under: <http://zietlow.com>
Most of the information, including sample contracts, is available in Spanish only.