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THE IMPACT OF RURAL ROADS

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THE IMPACT OF RURAL ROADS

FINAL REPORT

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ACRONYMS

AFVP	French Association of Volunteers for Progress
BTGR	Rural Engineering Technical Office (Regional)
CAF	Division of Administrative and Financial Affairs
CEE	European Economic Community
DAP	Support Unit for SMEs (DNGR)
DEP	Division of Studies and Planning (DNGR)
DNGR	National Directorate for Rural Engineering
DPDRE	Prefectoral Directorate for Rural Development
GF	Guinean francs
HCR	High Commission for Refugees
HIMO	labor-intensive methods
IDA	World Bank (International Development Association)
ILO	International Labor Organization
KM	kilometer(s)
M&E	monitoring and evaluation
NGO	nongovernmental organization
PASE	Education Sector Adjustment Project
PNIR	National Rural Infrastructure Project
SME	small and medium enterprise
SNAPE	National Rural Water Service
SPGR	Rural Engineering Technical Section (Prefectoral)
UME	mobile training unit
USAID	U.S. Agency for International Development

EXECUTIVE SUMMARY

USAID's objective in providing technical assistance to the Guinean National Directorate for Rural Engineering (DNGR) was to develop a permanent monitoring and evaluation system inside the DNGR to measure the impact of rural road improvements. This system has been in place for the past three years, and has effectively allowed the impacts of rural road development to be measured. The following report describes the results of these impact surveys, which were carried out on a semi-annual basis and covered 56 pre-selected sites. The report focuses on 22 sites along rural roads that have been improved thus far, as well as on the 18 villages along unimproved roads that were used as control sites.

The surveys show that the various impacts of improved rural roads were largely positive, and that the objectives of the National Rural Infrastructure Project (PNIR) are being achieved. There has been an effective increase in marketing activity in newly accessible areas, an increase in the percentage of agricultural commodities marketed, and a growth in available commercial transportation at a reduced cost.

The impact of rural roads on agricultural markets and marketing activities, a strategic objective of the PNIR project, is considerable. Over the last three years, marketing traffic has increased sixfold, while the number of people in markets, the number of commercial vehicle operators, and the number of traders have all more than doubled. The number of tax tickets levied on markets has increased threefold, which clearly indicates an increase in the number of commercial transactions. The volume of agricultural products sold in markets has increased fivefold, and transportation time has decreased to one-sixth of what it was, since the average speed on improved roads has increased from 6 kilometers per hour (km/h) to 35 km/h. As a result, transportation costs have been cut in half for passengers as well as for commodities, and traffic is no longer halted during the rainy season. Villages that were totally cut off are now linked to the outside world year-round.

Meanwhile, at the sites along the control roads, none of the impact indicators have changed. The comparison of these two sets of indicators clearly shows that the improvement of rural roads has had a positive impact on markets and the marketing of agricultural products. Considering all of the indicators mentioned above as independent variables, and the cost of transportation as the dependent variable, multiple regression analysis indicates a coefficient of correlation $R^2 = .84$. The surveys show clearly that the PNIR's main objective of facilitating market access for rural producers has been fully attained.

The impact of rural roads on increasing agricultural production, a further objective of the project, was marginal in year two, as farmers clearly decided to reactivate former plantations and begin farming holdings that had long lain neglected. This type of impact can only be evaluated over the long term, given the time and the inputs necessary to increase production. By year three, the impact of improved roads was clearly evident, since land under cultivation increased by 61 percent and the volume of commodities sold increased by 113 percent. While this might seem insignificant, we must remember that rural roads are only one of a number of factors that influence agricultural production. Important additional vectors of change include the extension of improved technologies, the availability of inputs, and access to credit. The indicators concerning the amount of land under cultivation accurately reflect farmers' attitudes, since villagers had promised to increase the size of their farms as soon as their marketing constraints had been resolved. Farmers

are also forming cooperatives and collectives, which indicates a greater amount of economic activity and a willingness to develop the agricultural potential of their areas.

Improving the roads has had many positive impacts for rural people. Services have significantly expanded, and government employees assigned to the villages are now actually present in those villages. Rural people enjoy increased access to health care and education: 77 percent of the villages located along improved rural roads now have a health post, compared with 29 percent before the roads were rehabilitated. While only 46 percent of these villages had schools before the road improvements, 95 percent of them now have schools. Eighty-six percent have deep bore wells with drinkable water, compared with 34 percent prior to the improvements. The women of the villages are particularly appreciative, since most of these changes directly impact their areas of responsibility.

Commercial transactions have multiplied, and weekly commerce has increased sixfold. Mobility has increased, while the time and cost of transportation have significantly decreased. All of these are signs that the quality of life for rural people has improved. In all the survey villages along improved roads, the local people have expressed satisfaction, claiming that their villages have been granted new life after years of frustration and isolation, and extending hope that their lives will become easier.

The impact on small and medium enterprises (SMEs) is far from negligible. Not only has the number of SMEs increased, but their business has increased as well. Training SME employees has allowed them to improve their negotiation of the competitive bidding process on DNGR contracts to rebuild rural roads. A number of problems remain, since only a few companies, such as Guiter, are truly performing. The mobile training unit (UME) of Mamou will focus in the future on planning and organizing worksites, on drawing up blueprints, and on preparing attachments and billing statements. These are all crucial elements that are currently lacking and cause considerable delays in work.

The institutional impact is measured by the DNGR's capacity to establish and develop an effective program to rebuild the roads. To do this, the DNGR has benefited from considerable donor assistance: 759 man-months of technical assistance have been expended until now, while more than 10,000 trainee-weeks of training have been financed since 1991, for a total cost of \$3.5 million. The construction and renovation of offices cost \$2.3 million, and the DNGR has acquired equipment for a total cost of \$4.5 million.

This support has allowed the DNGR to carry out dozens of general surveys, to solicit bids on 31 major road lots, and to sign 18 contracts with large companies. In addition, 173 contracts with communal work groups were signed. Until now, out of the 2,500 km of roads slated to be redone, 1,400 km have been improved. Considering all the DNGR's programs, with a projected total of 5,600 km of roads to be rebuilt, over 3,900 km are now finished. These figures show the project's impact on the DNGR's institutional capacity.

The environmental impact is minimal. Before the roads were improved, villagers and the local authorities worried that potential overpopulation would lead to land tenure disputes and deforestation. Measures were taken to limit damage to the forests, and reforestation projects were implemented. Vegetation and wildlife are little affected, and the risks of erosion have diminished due to improved drainage systems along the roads. The only new problem is that speeding vehicles now blow dust into houses along the roads during the dry season.

Since the project didn't open any new roads, but simply improved existing ones, we could in fact expect a minimal environmental impact. With the exception of the Forest Region of Guinea, where the influx of refugees from Liberia and Sierra Leone has contributed to significant environmental degradation, the process of rebuilding the roads has thus far caused no serious negative impact on the ecosystem or the environment.

SEVERAL REHABILITATED ROADS



Entrance of the village of Koroh, June 1996



The Touba-Malenta road, June 1996



The Lola-Gbata road, June 1996



The Lola-Laine road, June 1996



The Pita-Telimele road, approaching Donghol-Thouma, June 1996

INTRODUCTION

The agreement between the Republic of Guinea and the United States for the Guinea Rural Roads project (675-0216), signed on September 30, 1991, stipulates that the intended impact of the project was to provide access to all points linked by rural roads throughout Guinea at all seasons. This improved access would allow:

- ◆ an increase in the volume of goods and products marketed between linked zones;
- ◆ an increase in the percentage of agricultural production marketed; and
- ◆ a greater amount of available commercial transportation at a lesser cost.

These improvements, in turn, would contribute to increased agricultural production, to wider economic development, and to increased access to health care, education, and other rural services.

The National Directorate for Rural Engineering (DNGR) has established a rural roads impact assessment system in the Monitoring and Evaluation Section of the Division of Studies and Planning (DEP). The indicators selected to measure the impacts of road improvements were divided into six main categories:

- ◆ **The impact on markets:** Facilitating rural producers' access to markets is the foremost objective of the project. The effects of the project should be evaluated in terms of both access to markets and the volume of commodities marketed by rural producers.
- ◆ **The impact on agricultural production:** The goal of the project is to increase agricultural production and productivity. Evaluating the impact of the project on agricultural productivity was thus a necessity.
- ◆ **The impact on the rural population:** The improvement of rural roads induces various changes in village life by improving regional socioeconomic conditions. It is thus important to evaluate the impact of rural roads on the total quality of life of the affected rural population.
- ◆ **The impact on small and medium enterprises:** Another impact of the project should be an increase in the number of small local contracting firms, as well as improvement in those firms' ability to negotiate contracts and carry out road construction and maintenance work.
- ◆ **The institutional impact:** The project should reinforce the DNGR's capacity to develop and carry out a rural roads program. The DNGR must also be able to monitor progress over time, through the use of a monitoring and evaluation system.
- ◆ **The impact on the environment:** Finally, it is important to evaluate the impact of improved roads on the environment, to document the improvement or deterioration of the ecosystem and the habitat.

1. METHODOLOGY

The methodology developed for the rural roads impact monitoring and evaluation (M&E) system inside the DNGR was described in Volume One of the series of reports published in May 1994 by the Monitoring and Evaluation Section of the DNGR's Division of Studies and Planning (DEP). The major assumptions of this methodology are as follows:

1.1. IMPACT INDICATORS

In choosing impact indicators and in designing surveys, the main criterion was the sustainability of the M&E system. Emphasis was placed on developing "realistic" indicators that would be repeatedly measurable given the human and financial resources available to the DNGR. It would be useless to design an overly technical M&E system that the DNGR would be unable to sustain after the technical assistant's departure. In order to promote ownership, the responsibility for the design, data collection, and analysis of each survey was entrusted to the Monitoring and Evaluation Section of the Division of Studies and Planning in the DNGR. Each DEP agent was entirely responsible for the data collection, supervision, and analysis of two decentralized technical rural engineering offices (BTGRs), as well as for planning and scheduling the surveys. The list of selected indicators follows.

SELECTED IMPACT INDICATORS

Impact area	Indicators	Sources
Facilitate the marketing of agricultural production	No. of vehicles per market day No. of persons in market No. of tax tickets Volume of products sold: - foodstuffs - livestock - other products Length of trip for commercial vehicle operators Transportation cost - for passengers - per ton/merchandise Length of traffic interruptions	Survey Survey Administrator Marketing company Commercial vehicle operators Administrator
Agricultural production	Area farmed Crop diversity Input availability Former fields reactivated No. of cooperatives No. of agricultural projects Herd size Heads of livestock marketed	Survey Livestock service

1.2. SURVEY DESIGN

Surveys were designed based on available data and as a function of the selected indicators. These were checklists for traffic counts and opinion polls that targeted officials in the prefectures, subprefectures, and villages, as well as village surveys that interviewed local people. Some indicators were more qualitative than quantitative. While statistics are important, they do not adequately describe the problems of the local population prior to road improvements, nor do they address questions pertaining to the quality of rural peoples' lives. It was necessary to survey local peoples' attitudes and to assess their needs, first before the roads were rebuilt, then after they were improved, in order to adequately measure the impact of rural roads on the local population.

In order to evaluate the first impact level, "facilitating access to agricultural markets," several types of surveys were prepared:

- ◆ traffic counts, to determine traffic density along the sections of road under consideration;
- ◆ commercial vehicle surveys (producing both qualitative and quantitative data) in order to determine the volume of commodities transported, transportation costs, and transportation difficulties;
- ◆ attitude surveys of the local population (producing mostly qualitative data); and
- ◆ market surveys, which produced quantitative information.

These various surveys were carried out twice yearly during periods of intense agricultural activity: in November, during the harvest and sale of major crops, and then again in March, during field preparation and the marketing of fruit crops.

The second impact level, "increasing agricultural production," was evaluated based on population, farm and market surveys. These surveys were carried out in several stages: before improvement, in order to determine the problems farmers face, their expectations, and their plans; and then after improvement, in order to measure any changes in production levels. These surveys were necessarily carried out over several years in order to document the evolution and intensity of these changes. The surveys were also scheduled in March and November, before and after the rainy season.

The third level, "impact on the population," was evaluated based on surveys of prefectural, subprefectural, and village-level authorities, as well as on surveys of the local population. These data are basically qualitative. They provide a better understanding of how people in remote villages live, what their daily constraints are, and what they expect of rural road improvements. The surveys also included some quantitative information, such as daily traffic flows, distances, transportation time, and transportation costs, which are all elements that directly affect people living in the villages. The local population samples included separate categories for men and women, since each of these groups experiences isolation in a different way, and carry different expectations concerning road improvements. These surveys were carried out before and after the roadwork, in order to track changes in the inhabitants' situation over time.

The local population surveys are supplemented by farm surveys, based on interviews with farmers, that allow us to determine changes in agricultural production as well as in the diversity and volume of marketed commodities, and thus can be used to provide income estimates. These surveys should be carried out twice yearly, and will measure changes over the years.

The fourth level, "impact on SMEs," will be determined essentially inside the DNGR, the BTGRs, and the mobile training unit (UME), which is responsible for training SME personnel. These data will be supplemented by interviews of selected SMEs.

The fifth level, "institutional impact," was also carried out inside the DNGR and the BTGRs. There were no surveys at this level. The impact assessment was based on an organizational analysis, an evaluation of the capacity building provided by technical assistance, and the training evaluations of DNGR agents. This last set of data was based on the outcomes of workshops and seminars provided to all DNGR personnel since the beginning of the PNIR project.

Finally, the sixth level, "impact on the environment," was based on surveys of various local authorities, of projects, and of the rural people.

TYPES OF SURVEYS

No.	Surveys	Survey frequency
1	Traffic	Semi-annual
2	Prefectoral authorities	Pre, post, then annual
3	Subprefectoral authorities	Pre, post, then annual
4	Village authorities	Pre, post, then annual
5	Population (men)	Pre, post, then annual
6	Population (women)	Pre, post, then annual
7	Farmers	Semi-annual
8	Commercial vehicle operators	Semi-annual
9	Market	Semi-annual
10	Projects	Pre, post, then annual

TYPES OF SURVEYS CARRIED OUT AT CONTROL SITES

No.	Surveys	Survey frequency
1	Traffic	Semi-annual
2	Prefectoral authorities	Initial
3	Subprefectoral authorities	Initial
4	Village authorities	Initial
5	Population (men)	Initial
6	Population (women)	Initial
7	Farmers	Initial
8	Commercial vehicle operators	Initial
9	Market	Semi-annual
10	Projects	Initial

1.3. TRAINING BTGR AND SPGR PERSONNEL

Training the BTGR and prefectoral-level (SPGR) personnel to carry out surveys is essentially a process of establishing a sustainable system of data collection for monitoring and evaluating the impact of rural infrastructural improvements. These data must be collected on a regular basis, over several years. The personnel in charge of collecting this information must be trained in survey methodology as well as in collecting and reporting information to ensure that the data are accurate, reliable, and significant.

To this end, a training plan was established and training was carried out at four regional centers: Boké, Labé, Faranah, and N'Zérékoré. Each of those centers brought together the personnel of both BTGRs and the relevant prefectures. Thus, the personnel from the BTGRs of Boké and Kindia gathered at the center at Boké, those from Labé and Mamou at Labé, those from Faranah and Kankan at Faranah, and those from N'Zérékoré and Guéckédou at the center in N'Zérékoré. The courses took place over the space of a week, and alternated between classroom theory and practical surveys in the field. The number of participants per center is disaggregated in the following table.

SURVEY TRAINING AT THE REGIONAL CENTERS

Centers	BTGR	Prefectures	International Labor Organization	Total
Boké	2	10		12
Labé	2	17		19
Faranah	2	9	1	12
N'Zérékoré	3	14		17

1.4. CHOICE OF SURVEY SITES

The studies were generally carried out on two USAID-financed roads per prefecture. These roads were selected, in coordination with the road supervisor in each prefecture, based on two principal criteria:

- ◆ the size of the local population, and
- ◆ the area's agricultural potential.

(Note: choosing only two roads results from the impossibility of surveying all the improved roads. This would have demanded excessive time and means and would not have enhanced the outcome. Limiting the sample to a single road presents another problem, since such a sample could not represent all the impacts in a given area. A sample size of two roads allows us to draw more reliable conclusions.)

A village was selected on each of the roads for the traffic study, the market survey, and the village-level surveys. Each village was selected based on its size and its location on the road. The same village will be monitored for at least three years.

For each prefecture, a control road that was not scheduled to be improved was selected, according to the same criteria. This control road was monitored like the other two to establish a positive correlation between observed changes and the improvement of the roads.

The impact study was carried out in a total of 56 villages in 24 prefectures. Thirty-eight of the 56 villages selected were scheduled for rural road improvement. The focus of the study thus covers most of the country.

VILLAGES CHOSEN FOR SURVEYS

BTGR	Prefecture	Road	Km	Village	Improved	Control
Boké	Boké	Boké-Malapouya	35	Malapouya	x	
		Kalounka-Kanfarande	42	Kanfarande	x	
	Gaoual	Koubia-Kitar	57	Diguity		x
		Gaoual-Touba-Malanta	62	Kitiar	x	
	Koundara	Termessy-Koundara	113	Malanta	x	
		Sareboïdo-Samballo	23	Kembera	x	x
Boffa	Boffa-Coliah	31	Termessy	x		
Faranah	Faranah	Farandou-Beindougou	28	Farandou	x	
		Farandou-Forokonia	68	Kobikoro	x	
		Farandou-Sangoya	45	Sangoya	x	
	Dinguiraye	Dinguiraye-Lansanaya	25	Komboya		x
		Dinguiraye-Diatifere	55	Lansanaya	x	
	Kissidougou	Boue-Beindou	20	Diatifere	x	
Gbangbadou-Ouendekere		42	Surugambe	x	x	
Gueckedou	Macenta	Macenta-Konsankoro	100	Beindou	x	
		Macenta-Binikala	40	Ouendekere	x	
Kankan	Kankan	Kankan-Gberedou	30	Feindou		x
		Kankan-Missarena		Missarena	x	
	Kerouane	Konsankoro-Macenta	100	Moribadou	x	
Kindia	Dubreka Forecariah Coyah Telimele	Kindia-Guemetebe	20	Linko	x	
		Moussaya-Laya	18	Kanfarandou	x	
		Mangaba-Kyria	8	Khonia	x	
		Koba-Missira	30	Laya	x	
		Kambaya-Sogolon	42	Kiria	x	
		Paradiji-Koba	16	Missira	x	
Labe	Labe	Labe-Gally	30	Tourkoun	x	
		Labe-Touny		Koba	x	
	Lelouma	Diountou-Lafou	15	Tarihoye		x
Tougue	Tougue-Kollet-Kouratongo	40	Djinkan	x		
			Kouratongo	x		
Mamou	Mamou	Dounet-Saramoussaya	62	Kaffa	x	
		Bafing-Kongore	57	Herico	x	
	Pita	Pita-Telimele	92	Poredaka		x
		Timbi-Madina-Ninguelande	15	Alphaya		
				Donghol-Touma	x	
		Ninguelande	x			
		Samba-Barry			x	

BTGR	Prefecture	Road	Km	Village	Improved	Control
N'Zerekore	N'Zerekore	Gouecke-Womey	9	Womey	x	
		Koule-Makposou	27	Koro	x	
	Beyla	Dinko-Tinkoro	15	Koule sud		x
		Moussadou-Famoila	15	Sue	x	
	Lola	Lola-Gbata		Famoila	x	
				Dabadou		x
		Lola-Laine	41	N'Zon	x	
			35	Kokota	x	
				Balimou		x
TOTAL	22			56	38	18

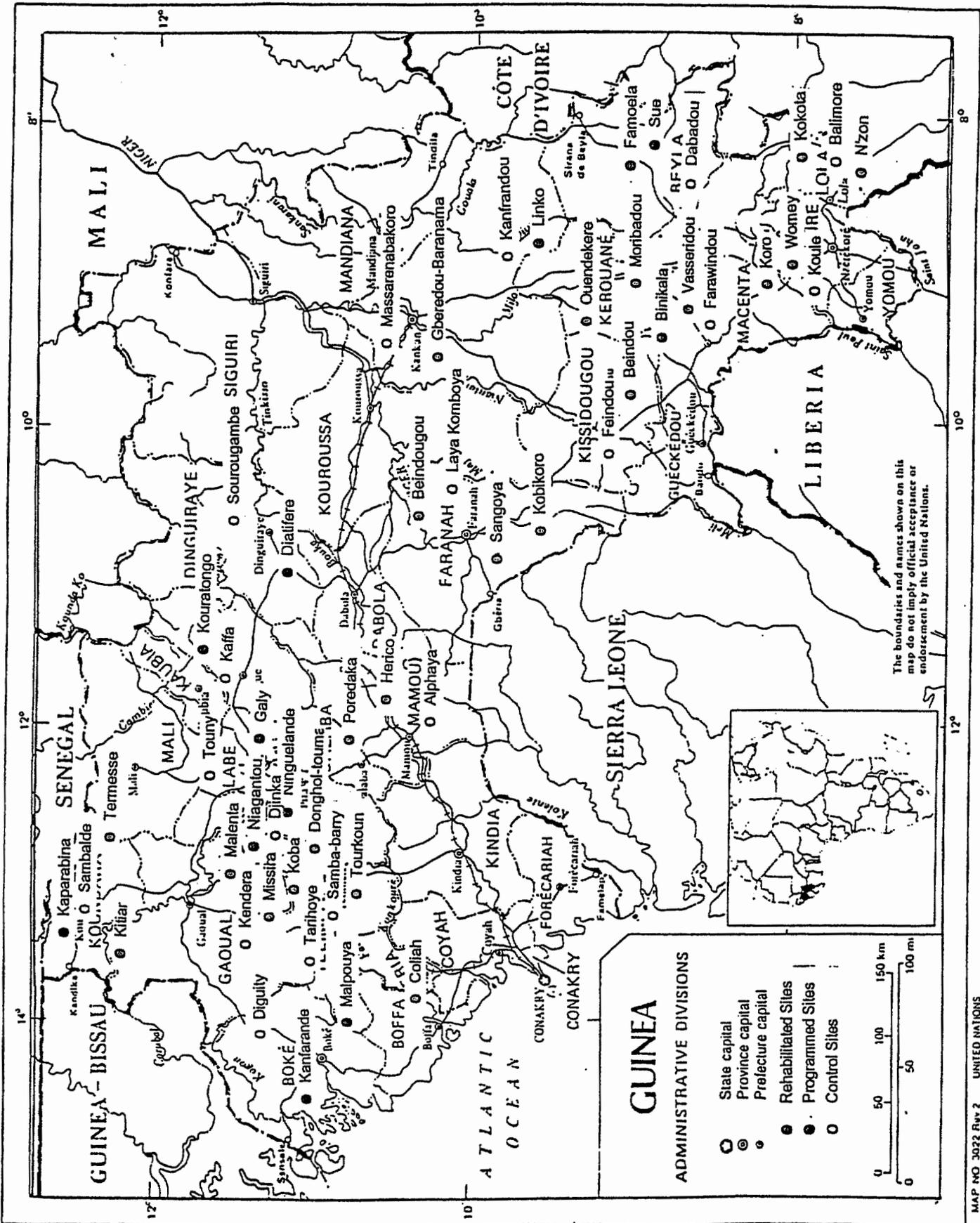
1.5. CREATING A DATABASE

The first surveys of the 56 villages allowed the creation of a database to serve as a point of reference for subsequent impact measurements. In effect, this first series of surveys provides a profile of the state of things before road improvements, by describing life in the villages, enumerating the villagers' problems, and defining their expectations. The quantitative data provide a baseline on key indicators, such as daily traffic flows, market size, number of commercial vehicle operators and traders, etc.

These data were published in a series of eight volumes, one volume per BTGR. Volume One was devoted exclusively to the survey methodology.

RELEVANT PUBLICATIONS

Volume	BTGR	Publication date	Number of pages
Volume 2	Boké	December 94	119
Volume 3	Labé	December 94	148
Volume 4	Mamou	February 95	135
Volume 5	N'Zérékoré	April 95	135
Volume 6	Guéckédou	February 95	92
Volume 7	Kankan	June 95	80
Volume 8	Faranah	November 95	95



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1.6. DATA ANALYSIS

This impact study is based on the 22 roads that have been improved to date (November 1996) and 18 control sites, covering every prefecture. The data used for the analysis were collected between 1994 and 1996 by DNGR agents. The 22 roads were spread throughout the country, as the map and the following table show.

SAMPLE ROADS IMPROVED BY NOVEMBER 1996

Site	BTGR	Prefecture	Road	Km	Date finished
Coliah	Boke	Boffa	Boffa-Coliah	31	under construction
Kithiar	Boke	Gaoual	Koubia-Kitiar	57	July 1994
Malenta	Boke	Gaoual	Gaoual-Touba-Malenta	62	July 1994
Termesse	Boke	Koundara	Koundara-Termesse	113	July 1994
Koba	Kindia	Telimele	Paradji-Koba	16	June 1996
Missira	Kindia	Telimele	Koba-Missira	30	June 1996
Tourkoun	Kindia	Telimele	Kambaya-Sogolon	42	November 1996
Beindougou	Faranah	Faranah	Faranah-Beindougou	28	1993
Sangoya	Faranah	Faranah	Faranah-Sangoya	45	June 1996
Kobikoro	Faranah	Faranah	Faranah-Forokonia	68	November 1996
Gberedou-B.	Kankan	Kankan	Kankan-Gberedou	30	June 1996
Moribadou	Kankan	Kerouane	Konsankoro-Macenta	100	October 1996
Beindou	Gueckedou	Kissidougou	Boue-Beindou	20	June 1995
Ouendekere	Faranah	Kissidougou	Gbangadou-Ouendekere	42	June 1995
Herico	Mamou	Mamou	Dounet-Saramoussaya	62	January 1995
Vasseridou	Gueckedou	Macenta	Macenta-Konsankoro	100	October 1996
Poredaka	Mamou	Mamou	Bafing-Gongore	57	March 1993
Donghol-Touma	Mamou	Pita	Pita-Telimele	92	July 1994
N'Zon	N'Zerekore	Lola	Lola-Gbata	41	May 1996
Womey	N'Zerekore	N'Zerekore	Gouecke-Womey	9	July 1995
Koro	N'Zerekore	N'Zerekore	Koule-Makpozou	27	July 1995
Kokota	N'Zerekore	Lola	Lola-Laine	35	May 1996

2. IMPACT ON MARKETS

Facilitating access to rural markets is the objective of the PNIR project. For this reason, the indicators chosen to measure this impact are very important. There are several different categories of these indicators. The first category concerns the marketing process itself. These indicators include traffic counts, the number of people who attend markets, the number of commercial vehicle operators, traders, stall- and storeowners, distances and times of transportation, and the number of months without traffic. These are all indicators chosen to show the intensity of commercial activity.

Another series of indicators concerns agricultural commodities sold. These indicators allow a determination of the volume of goods marketed before and after road improvements. Finally, a series of indicators shows the diversity of commodities purchased by the rural population, which provides an index of the quality of life in the villages.

Tables 1 through 11, based on surveys conducted by the \DNGR in November 1994, 1995, and 1996, show the impact of improved roads on markets and agricultural marketing. As the various tables indicate:

- ◆ market traffic has increased fivefold;
- ◆ the number of people in markets has more than doubled;
- ◆ the number of commercial vehicle operators and traders has doubled;
- ◆ the number of tax tickets distributed has increased threefold;
- ◆ the volume of commodities marketed has increased by a third;
- ◆ the time of transportation decreased sixfold;
- ◆ the cost of transportation has decreased by a third;
- ◆ traffic now continues during the rainy season; and
- ◆ villages that were completely cut off are now linked to the outside world.

The convergence of these indicators clearly shows the impact of roads on markets and marketing. A multiple regression analysis that considers all these indicators as independent variables and selects the cost of commodity transportation as the dependent variable produces a very high coefficient of correlation ($R^2 = .84$). The time of transportation alone accounts for 75 percent of cost variability ($R^2 = .75$), which is not surprising since the time of transportation provides an excellent indicator of road conditions.

The first indicator concerns the volume of market traffic, because it influences all other indicators. Market traffic is the bottleneck of marketing. The lack of roads constrains both marketing activities and the development of market institutions. Road improvements stimulate all activities and provide rural people with a sense of hope. This indicator reveals the development of economic activities linked to road improvement. Beginning in the first year, the traffic on improved roads increased fourfold, then sixfold by the end of year three. Over the same period of time, traffic on control roads remained the same, clearly indicating that the change in traffic levels is due to the rehabilitated roads.

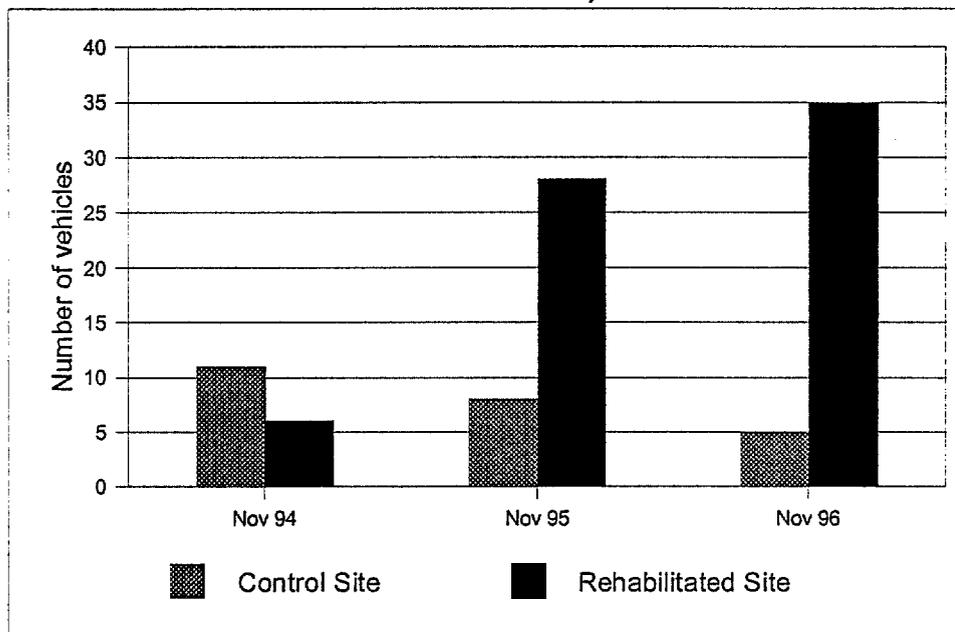
TABLE 1
TRAFFIC IN THE MARKET, WEEKLY

	Number of survey sites	1994	1995	1996	Change
Control sites	18	11	8	5	-54%
Rehabilitated sites	22	6	28	35	+457%

Note: The numbers reported in this and following tables represent the average for the sites. The percentages in these tables are calculated based on real numbers and not on the rounded numbers reported in the tables.

Source: The sources for this and all following tables are the DNGR surveys, November 1994, 1995, and 1996.

FIGURE 1
TRAFFIC IN THE MARKET, WEEKLY



Agricultural marketing is dependent on access. Commercial vehicle operators cannot get into some subprefectures, but if they do, they can impose their prices. Commercial transactions are very limited, and a number of goods are not found in markets because of the high cost of transportation. In Vasséridou, for instance, before the road was rebuilt, women complained that "all commercial transactions are subverted by the lack of transportation. Our produce rots, because there is no one to purchase it." Just about everywhere, local authorities consider road improvement as beneficial and encouraging for producers, "...because many buyers will come to our markets with many vehicles" (Ouendékéré).

Rural people expect that better roads will normalize the terms of exchange between farmers and traders. When roads are in bad shape, traders "...exploit farmers by giving them loans that they have to reimburse in kind at the next harvest, but at unfair rates" (Malapouya). The farmers of this village hope that with improved roads "...we will no longer go into debt before the harvest, and we will be able fix our own prices."

As soon as the roads are improved, farmers gain powers of negotiation. In Porédaka, marketing activity has considerably increased, to such a degree that "...now buyers are looking for producers." Traders come from far away, and the men of Porédaka claim that "...our products sell well, many traders come." Local farmers add that: "Now we are happy, because we sell our products when and where we want to. Porédaka has become a crossroads."

In Termesse, village authorities recognize that "traders come to our villages to buy our products at prices we determine." In Kithiar, the local people recall that: "Our granaries used to be closed for lack of buyers... now they are empty." In Donghol-Touma, farmers say that: "Since the improvement of the road, traders come to our homes, and load their trucks near our fields. Wholesalers come here, and in our market we find the same products that are sold in Dakar, Conakry, or Pita." In Malenta, authorities confirm that "...while a great deal of the harvest was lost for lack of a road and the lack of means of transportation before the improvement of the road, today farmers are able to send commodities to urban centers." Finally, in Hérico, the men say that "before the improvement of the road, our products were headloaded.... Mangoes mostly rotted. We went to look for buyers with sacks loaded on our heads. Today, they come to us, into our homes, to buy our products."

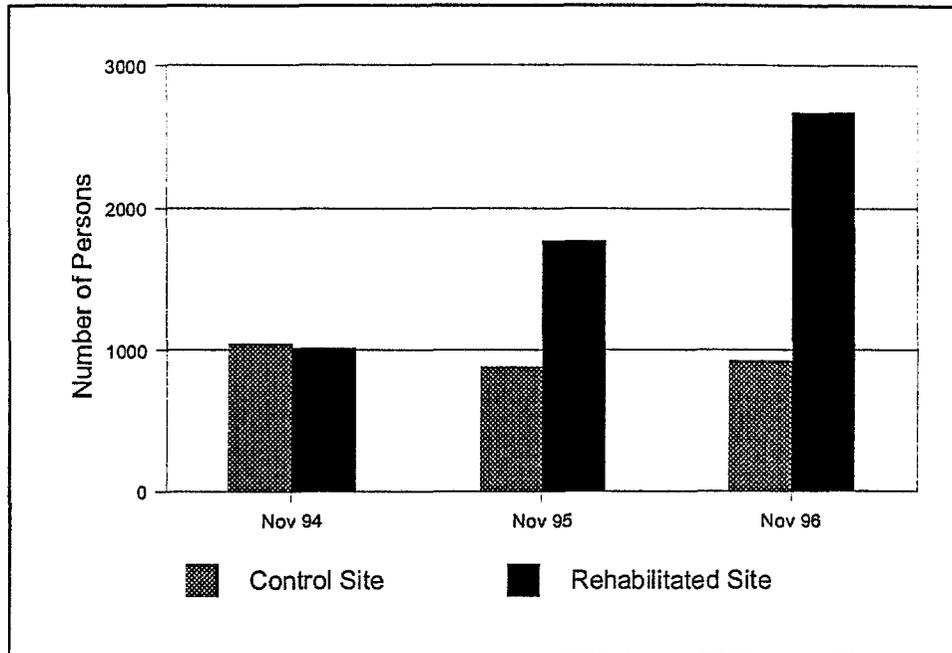
The number of people attending markets shows the evolution of markets as a function of road conditions. This indicator reveals the development of commercial activity in the area.

Table 2 shows that attendance at control site markets has practically not changed; indeed, it has decreased by 12 percent. On improved sites, market attendance has almost tripled in three years.

TABLE 2
NUMBER OF PEOPLE AT MARKET, WEEKLY

	Number of survey sites	1994	1995	1996	Change
Control sites	18	1,048	882	923	-12%
Rehabilitated sites	22	1,017	1,770	2,673	+163%

FIGURE 2
NUMBER OF PEOPLE AT MARKET, WEEKLY



Thus we see the direct influence of the improved road on this progression. As the people of Malenta say: "On the market, we see many changes.... You have to be present in the area to see the difference."

As soon as the road is rebuilt, the market develops: more people begin attending, more commercial vehicle operators and traders show up, goods are sold and become accessible.

The authorities of Malenta add that "...before fixing the road, 800 people would show up on market day, now more than 2,000 people show up...the number of traders has climbed from 20 to 50." The women of Kithiar have had the same experience: "Nowadays, now that the road is rebuilt, many buyers come to the market." In Termesse, as well, the local authorities indicate an increase in market attendance: "Traders and buyers come from Koundara, Labé, and even Senegal to purchase agricultural products and supply manufactured goods to the market. The number of regular traders has increased from 10 to 20...more than 400 people attend the market, whereas only 200 would come before the road was redone." In Hérico, there is no market, but men say that "...people can now go to Kégnéko each Monday, where there are many traders and buyers." In Porédaka, men recount the changes that have occurred since the road was refurbished: "The number of people in the market has gone from 200 to 600." The women of Donghol-Touma acknowledge that their market is quite busy: "The number of people attending the market has gone from 800 to more than 1,200."

Since the roads were improved, the number of commercial vehicle operators who drive through the villages has considerably increased. As Table 3 shows, the number of commercial vehicle operators has increased by 144 percent on improved sites, compared with a 35 percent decrease on the control sites. The increase is undoubtedly due to road improvement. In Beindou, for example, a commercial vehicle operator

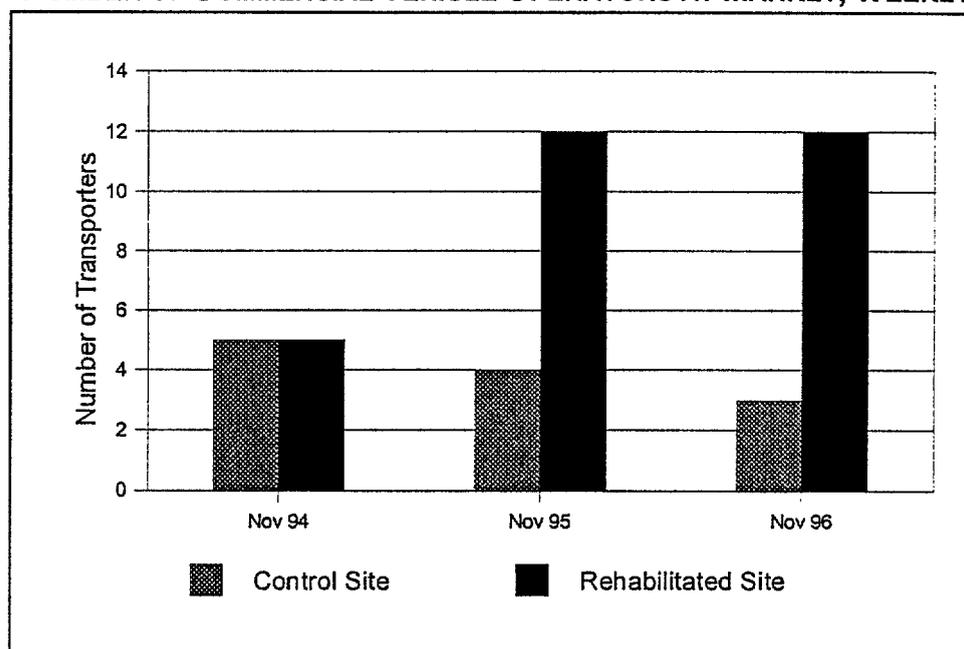
relates that: "Before the road was rebuilt, I was the only means of transportation beyond Faranah. Passengers were willing to wait even two days for me to show up. Today, people reach Beindou even in small passenger cars. There is a lot of competition and fares have gotten lower."

With a developing transportation network, the whole economic life of the area changes, allowing economic and personal transactions between villagers and people from commercial centers.

TABLE 3
NUMBER OF COMMERCIAL VEHICLE OPERATORS AT MARKET, WEEKLY

	Number of survey sites	1994	1995	1996	Change
Control sites	18	5	4	3	-35%
Rehabilitated sites	22	5	12	12	+144%

FIGURE 3
NUMBER OF COMMERCIAL VEHICLE OPERATORS AT MARKET, WEEKLY



Before the roads were rebuilt, commercial drivers were very hesitant to service certain villages because of the high risks involved and the numerous breakdowns that occurred due to poor road conditions. In Malapouya, for example, transportation providers complain that frequent breakdowns and high fuel costs, coupled with the enormous prices they pay for spare parts, drive their costs so high that their union has to force them to service all the villages along the road. In the rainy season, they often take 10 to 11 hours to travel 35 km on the road, and "...we often end up spending the night on that road, either because we have run out of fuel or because our tires have been torn up by rocks and holes...." All vehicle operators complain

about worn tires, broken springs, tired chassis, and damaged rear suspensions in order to justify the cost of their services.

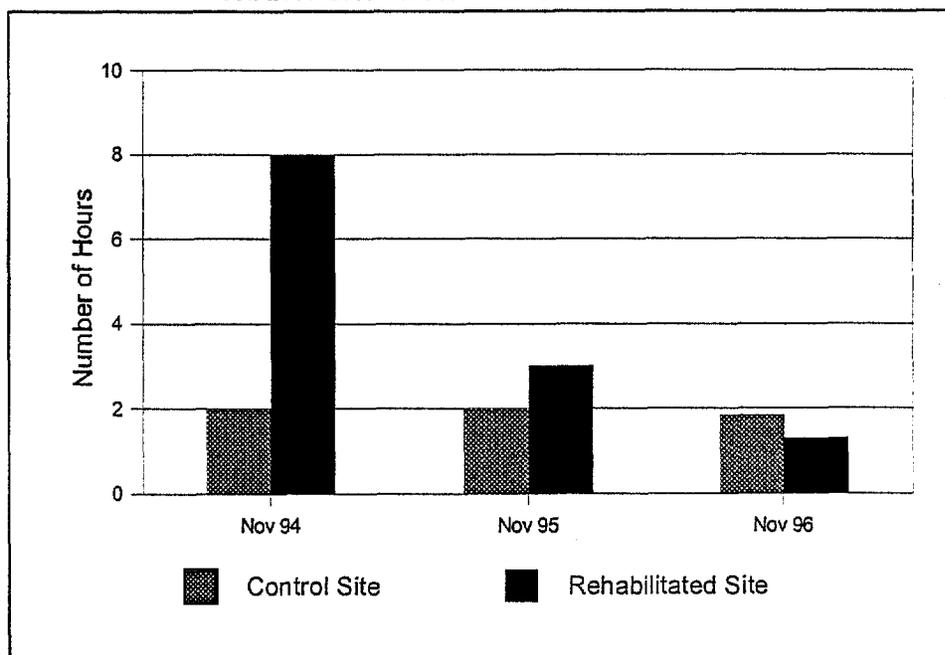
On the improved roads, the operators acknowledge that fuel consumption goes down, tires last longer, breakdowns are less frequent, and the cost of transportation decreases. The size of loads increases, as does the number of trips. Finally, and most important, the length of each trip decreases.

As Table 4 shows, transportation time has decreased by 84 percent on the rebuilt roads, going from eight hours for an average trip of 48 km to only an hour and a half. In other words, on the average, it takes one-sixth of the time to go from one place to another on the improved roads.

**TABLE 4
TRANSPORTATION TIME TO THE VILLAGE**

	Number of survey sites	1994	1995	1996	Change
Control sites	18	2 h	2 h	1 h 50	-4%
Rehabilitated sites	22	8 h	3 h	1 h 30	-84%

**FIGURE 4
TRANSPORTATION TIME TO THE VILLAGE**



In Hérico, for example, a driver who has used the 62-km road for the past five years claims that: "Before the road was redone, it was a four-hour trip. Now it takes an hour and a half. Both fuel consumption and breakdowns have diminished." In Kithiar, drivers confirm that "...transportation time was six hours for 92

km, but it now takes only two hours, and the volume of goods we transport has gone from one to two tons." The men of Kithiar recall that "...vehicles that used to take between two and three days to go from Kithiar to Koumbia now only take an hour to travel the 57 km between those two villages."

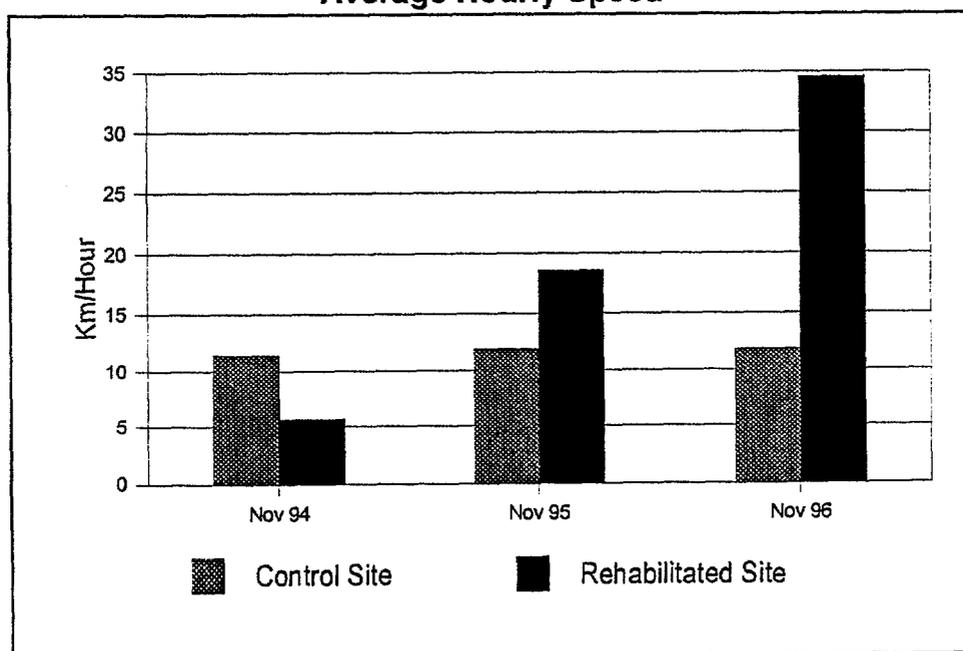
The most impressive data come from the village of Malenta, where the average trip went from 48 to 4 hours. While four hours may still seem like a long time to travel a distance of 64 km, drivers need to take a ferry (which can cause delays), cross two mountain passes (before the road was improved, trucks used to have to unload their cargoes to climb these sections), and negotiate a lengthy stretch of bare rock (bowal) that has only been superficially improved because of the excessive costs of further improvement.

It must be noted that before the roads were improved, the average speed for all 22 roads that were studied was 4 km/h. In Termesse, a driver noted the advantages of reduced travel time in the following terms: "Before the road was improved, it took me six hours. Now it takes me three, so I can make two trips per day."

**TABLE 5
AVERAGE HOURLY SPEED
(KM/H)**

	Number of survey sites	1994	1995	1996	Change
Control sites	18	11.5	12.0	11.9	+4%
Rehabilitated sites	22	5.7	18.6	34.6	+84%

**Figure 5
Average Hourly Speed**



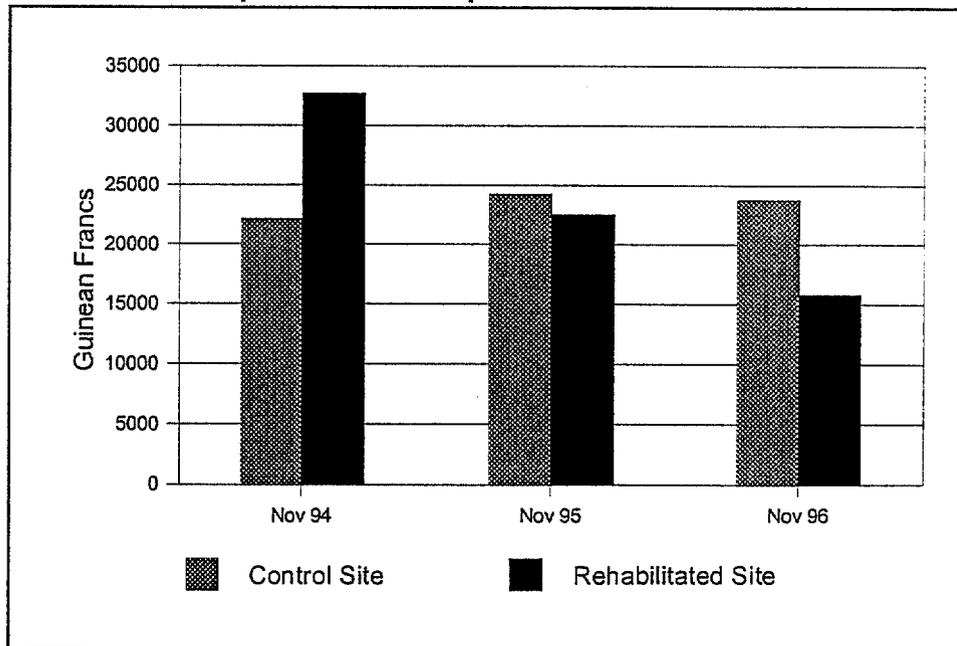
The average hourly speed may still seem slow on these roads, but it must be noted that on some legs there are ferries, which reduces the overall speed since the wait can be of variable length. On the improved roads overall, a truck can reach speeds of up to 80 km/h, although this exceeds the recommended rate of 40 km/h. There was no significant change on the control roads.

TABLE 6
TRANSPORTATION COST PER TON OF MERCHANDISE
(GUINEAN FRANCS)

	Number of survey sites	1994	1995	1996	Change
Control sites	18	22,143	24,269	23,808	+ 8%
Rehabilitated sites	22	32,750	22,579	15,841	-52%

In correlation with the decrease in transportation time, the cost of transportation has clearly diminished, for merchandise (see Figure 6) as well as for passengers (see Figure 7). The cost of transportation for a ton of merchandise decreased on the average by 52 percent on the 22 improved survey roads, and by 47 percent for passengers.

Figure 6
Transportation Cost per Ton of Merchandise



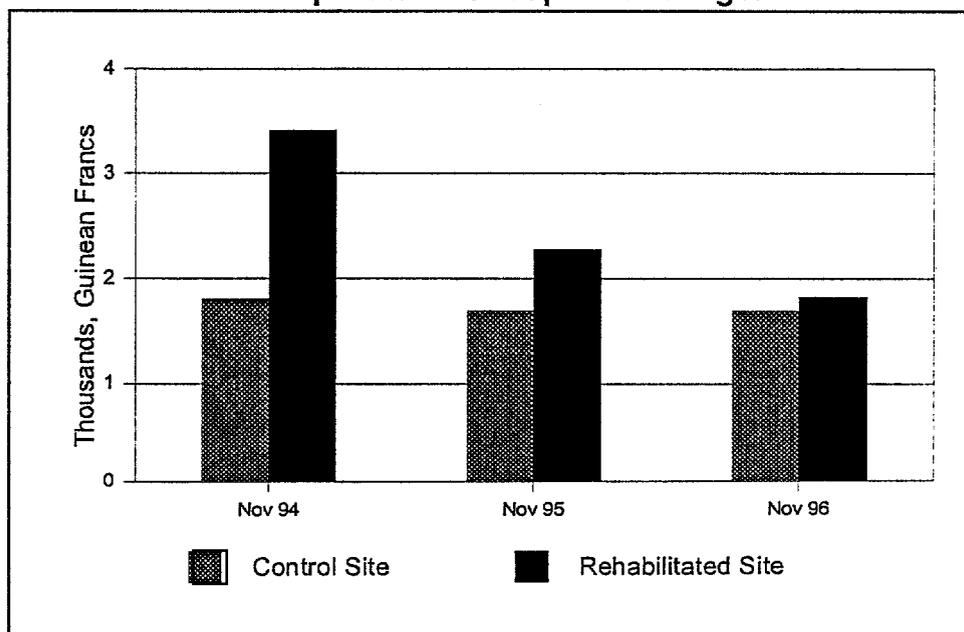
In Donghol Touma, the changes are rather significant. Local authorities claim that "...to travel the 60 km between Pita and Donghol Touma, trucks would take eight hours. The cost was 4,000 GF per passenger, whereas now it is 2,000 GF. Transporting a ton of merchandise used to cost 30,000 GF. Now it is 15,000 GF. Things used to be very expensive in the market. Now, the price of everything has gone down."

The comments of the local authorities in Hérico are particularly interesting. They claim that the appearance of their village has changed quite a bit: "There has been a lot of new construction, thanks to decreased transportation costs. The cost of trucking a ton of cement from Mamou to Hérico has gone from 20,000 to 10,000 GF, which has encouraged many people to rebuild their homes."

TABLE 7
TRANSPORTATION COST PER PASSENGER
(GUINEAN FRANCS)

	Number of survey sites	1994	1995	1996	Change
Control sites	18	1,800	1,693	1,690	-6%
Rehabilitated sites	22	3,415	2,270	1,818	-47%

Figure 7
Transportation Cost per Passenger



The decrease in transportation costs, for merchandise as well as for passengers, is one element that rural people particularly appreciate. The women of Donghol Touma express their satisfaction in the following

way: "We take pleasure in traveling on this road...even pregnant women can now attend ceremonies in other villages... we travel in luxury cars: Peugeot 404s and 504s...Toyotas with the extended cabs, instead of those old four-by-fours...and when we arrive at our destination our clothes are still clean." The men of Donghol-Touma conclude: "Thank God, we now may travel without getting tossed around, without getting stuck in the mud.... There are Peugeots and Toyotas available that take less than an hour to get us where we want to go, and the fares have decreased from 5,000 to 2,500 GF.

Along with the number of commercial transportation providers, the number of traders and wholesalers has also increased, which allows for increased agricultural marketing activities and makes a greater diversity of goods available to the local population. Table and Figure 8 show that the number of traders has increased significantly, with an increase of 48 percent. As local people just about everywhere state, "...there are now quite a few traders who come with a lot of baggage."

TABLE 8
NUMBER OF TRADERS AT MARKET, WEEKLY

	Number of survey sites	1994	1995	1996	Change
Control sites	18	23	20	11	-52%
Rehabilitated sites	22	23	31	34	+48%

FIGURE 8
NUMBER OF TRADERS AT MARKET, WEEKLY

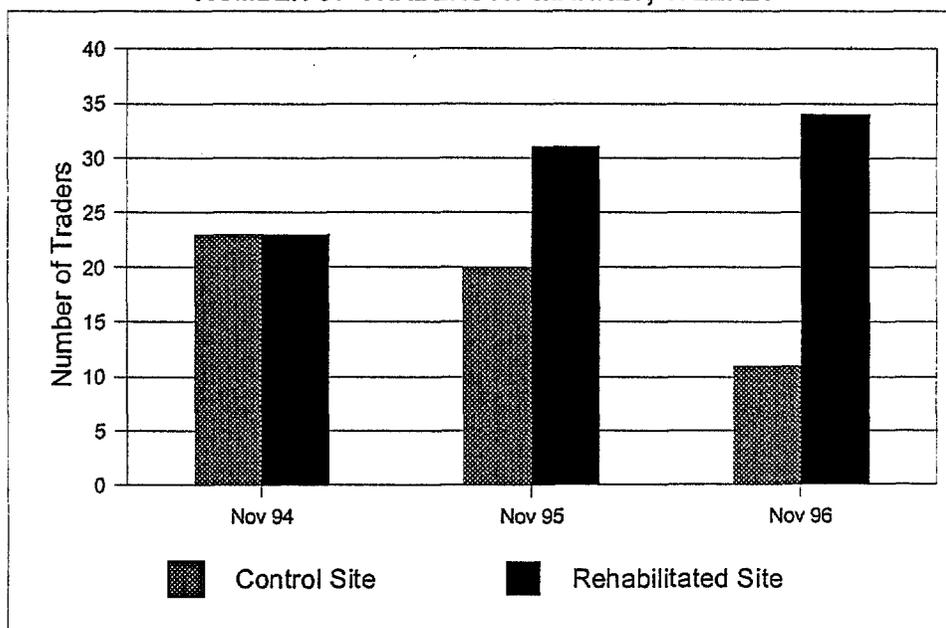


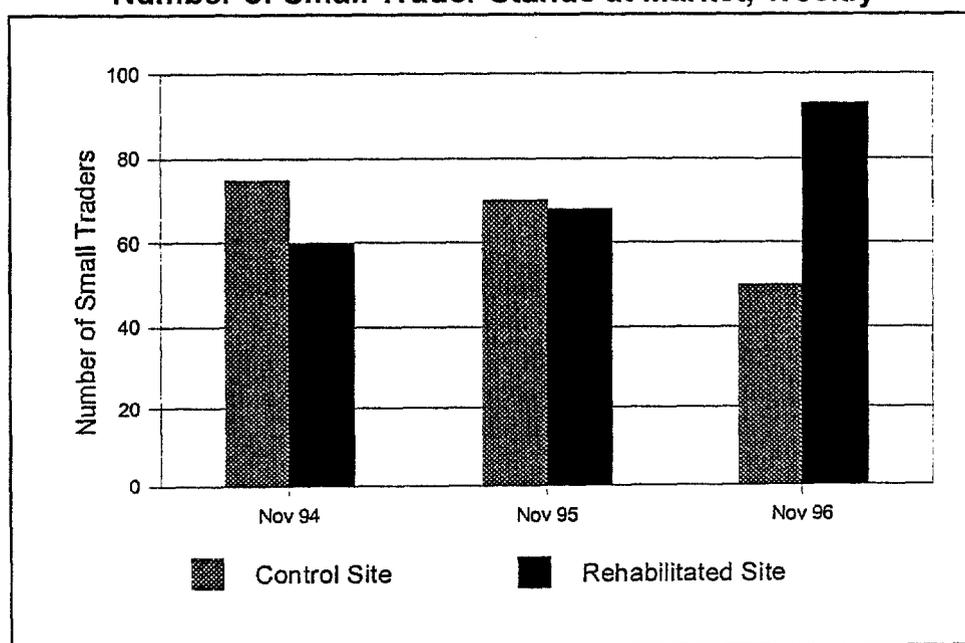
Table 9 shows that the volume of commodities sold over the past 3 years has increased more significantly for the improved sites than for the control sites, since it is now easier to truck merchandise out, and traders travel to the sites in order to purchase commodities. This indicator will only increase over the next few years, since the size of holdings will increase along with the volume of agricultural production. For the first two years, we may consider that the commodities that were sold would in the past have remained in storage or have rotted in the fields. The third year after the road improvements is theoretically the one that should show the increase in production, due to an increase in the area under cultivation.

Agricultural marketing has undergone major changes along the improved roads, at first showing a slight increase in year two, then a considerable rise in year three, with a sixfold increase over year one. This can be explained by the fact that in year two, farmers sold all their surplus, and then increased the size of their holdings since they had an outlet for their production.

**TABLE 9
NUMBER OF SMALL TRADER STANDS AT MARKET, WEEKLY**

	Number of survey sites	1994	1995	1996	Change
Control sites	18	75	70	50	-33%
Rehabilitated sites	22	60	68	93	+54%

**Figure 9
Number of Small Trader Stands at Market, Weekly**



The number of small traders operating market stands has increased from an average of 60 stands per village to 93, while the number has decreased at the control sites. Therefore, in villages with improved roads, people have access to a greater quantity and a greater diversity of merchandise.

Thus, in Porédaka, the local authorities assert that: "Before, citizens produced little and even that small amount would rot for lack of buyers and means of transportation. Now buyers are looking for producers." The farmers agree: "Our products sell well. Buyers come from all over to buy our crops." In Hérico, the men add: "We used to go looking for buyers with our crops on our heads. Now they come to us, into our homes to purchase our crops, like potatoes, peanuts and plantains." The women confirm this from their perspective, since, "...before, the traders who came from Mamou did not purchase much because of the bad road conditions. Now, we can sell all of our garden produce, such as peppers, eggplant, sweet potatoes, and peanuts, right here."

In Porédaka, the villagers acknowledge that "...we now find all sorts of goods in the market. Traders bring an array of goods that are only sold in small quantities...rice, cement, tin sheets, soap, salt, and fresh fish.... These are things that we used to be able to get only in Mamou."

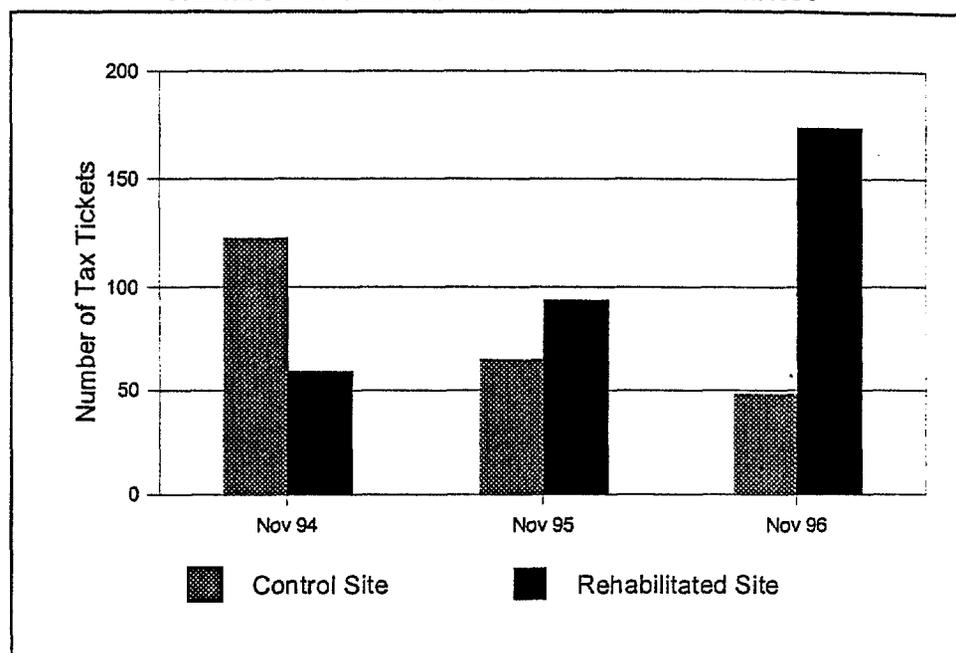
The number of tax tickets handed out in markets is a good indicator of the development of transactions in markets. Each vendor, concession stand operator, or other type of merchant must pay a tax before selling any products.

The taxes that have been levied in markets on improved roads have increased threefold, and have decreased by the same ratio in the control sites over the same period of time. This indicates that road improvement leads to increased taxes, and indirectly helps improve market infrastructure, for the greater benefit of the local population.

TABLE 10
NUMBER OF TAX TICKETS DELIVERED AT MARKET

	Number of survey sites	1994	1995	1996	Change
Control sites	18	123	65	48	-60%
Rehabilitated sites	22	59	94	174	+195%

Figure 10
Number of Tax Tickets Delivered at Market



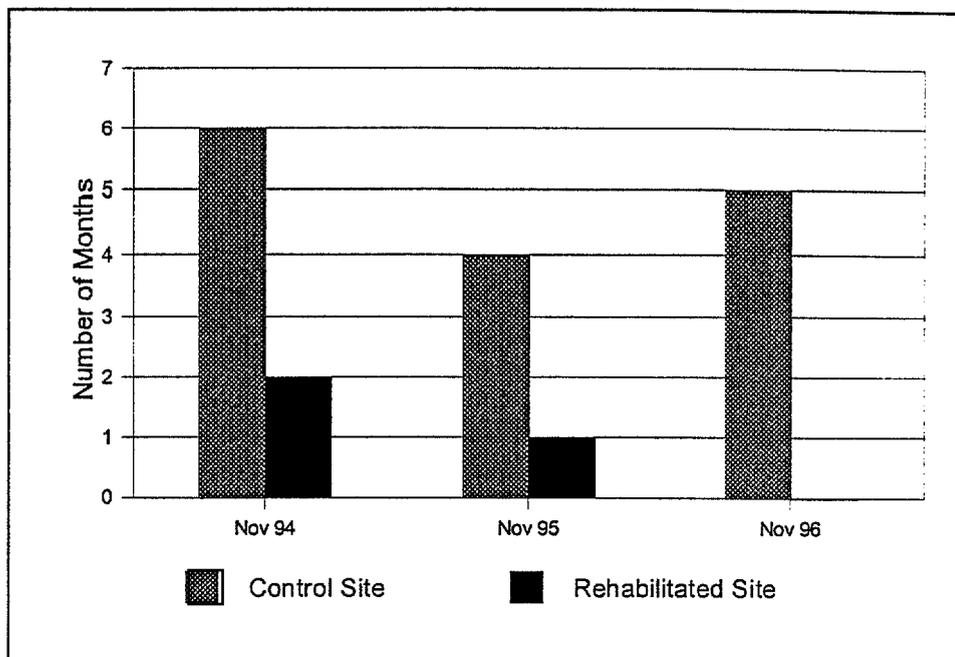
The local authorities entertain the hope that they can "...change the perception of government income derived from taxes and various other contributions in markets.... These contributions have a social purpose, which is to build schools, clinics, markets, etc..." (Ouendékéré). In Donghol Touma, for instance, a new market was built, with more than 200 stands for vendors. During the same time, the situation was getting worse on the control sites.

Table 11 presents the number of months without traffic at the improved and the control sites. At the control sites, the number of months without traffic remains significant, with an average of a five-month interruption, i.e., the entire rainy season. This is generally due to the lack of rural infrastructure necessary to allow trucks to ford larger bodies of water. On the improved sites, the number of months without traffic was less originally, close to two months. Road improvements allow villages to be linked year-round, because they include drainage and bridge works to allow regular and constant traffic flows.

TABLE 11
NUMBER OF MONTHS WITHOUT TRAFFIC

	Number of survey sites	1994	1995	1996	Change
Control sites	18	6	4	5	-13%
Rehabilitated sites	22	2	1	0	-100%

Figure 11
Number of Months Without Traffic



CONCLUSION

The tables presented in this section clearly show the impact of rural road improvements on markets and agricultural marketing. In three years' time, market traffic has increased sixfold, the number of people attending markets has tripled, the number of transportation professionals and traders has doubled, the number of tax tickets collected in markets has tripled, the volume of agricultural commodities sold has increased fivefold, travel time has decreased by a factor of six, the average speed on the roads has gone from 6 km/h to 35 km/h, the cost of transportation has been cut in half, and traffic is no longer interrupted during the rainy season. Over the entire year, villages that were totally cut off are now linked to the outside world.

The convergence of all these indicators clearly shows the impact of the roads on markets and marketing. This is confirmed by a multiple regression analysis, which provides a correlation coefficient of $R^2 = .84$ with the cost of transportation. We can thus affirm, without the slightest ambiguity, that the final objective of the project — to “facilitate access to markets for rural producers” — has been fully achieved.

The Lola-Laine road in November 1994



In June 1996, the same road is well-traveled.



26A

3. IMPACT ON AGRICULTURAL PRODUCTION

The selected indicators for this impact category concern primary cash crops, livestock, and the organization for production. A first group of tables presents data concerning the types of crops raised by the entire set of farmers, the areas cultivated, and the yields obtained. A second series of tables concerns fruit crops and tree crops, and a third series describes livestock.

For this category of indicators, major changes are not to be expected in the first year after the roads have been improved. Such impacts will only appear over the long term, as farmers progressively increase the size of their farms and intensify their production. Furthermore, roads are but one of several factors affecting agricultural production. In order to increase yields, a number of other constraints must be addressed.

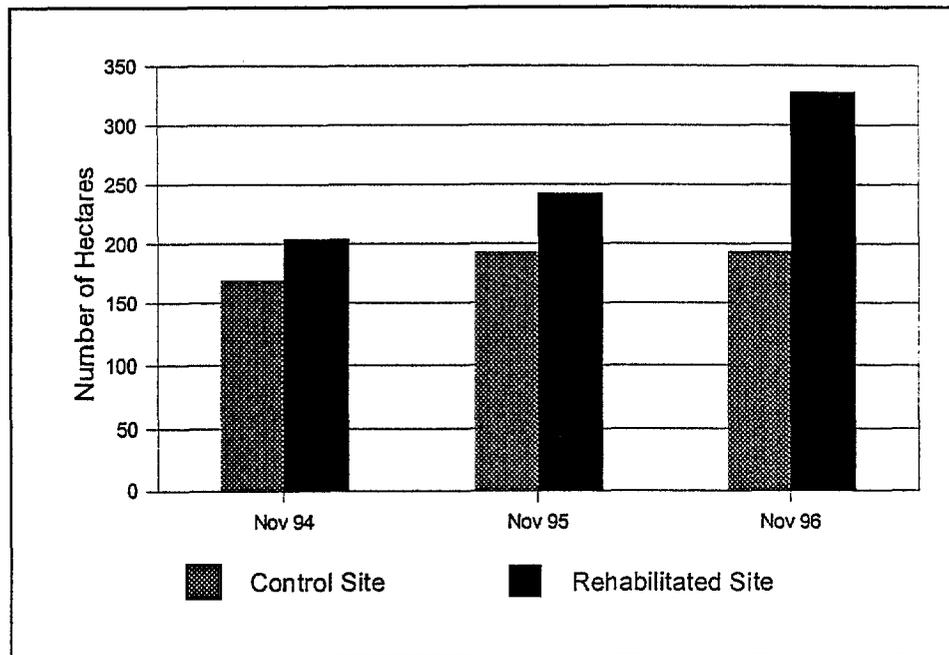
There are already positive developments, as in Hérico, where authorities report that: "There has been a learning curve between the subprefectures, the villages, and the district levels.... Before the roads were improved, Soumbalako was the only place growing a lot of potatoes. Since the road was redone, we have had a lot of demand for improved potato seeds in almost all subprefectures, since they all seem to want to follow Soumbalako's example and organize agricultural collectives."

As Table 12 shows, farmers increase the size of their fields progressively, since they first want to ensure that there is a market for their products. Only in the third year after the road improvement did the areas under cultivation increase significantly. This incidentally confirmed that the farmers were true to their stated intentions in the pre-improvement round of surveys: They had promised to increase the size of their farms if the roads were improved.

TABLE 12
CULTIVATED LAND
(HECTARES)

	Number of survey sites	1994	1995	1996	Change
Control sites	18	169	193	194	+15%
Rehabilitated sites	22	204	243	328	+61%

**Figure 12
Cultivated Land**



In Vasséridou, for example, the local people claim "...there are now a lot of fields, since a number of villagers have begun farming again...a number of fertile bottomlands that have long been neglected are now being worked."

The amount of agricultural produce exported each month from villages along the rehabilitated roads has increased considerably. This is because, after having sold all of their surplus produce the second year, the villagers increased the amount of excess since they had a sure outlet for it.

**TABLE 13
AGRICULTURAL PRODUCE EXPORTED PER MONTH
(METRIC TONS)**

	Number of survey sites	1994	1995	1996	Change
Control sites	18	22	24	21	-5%
Rehabilitated sites	22	15	24	86	+469%

Figure 13
Agricultural Produce Exported per Month

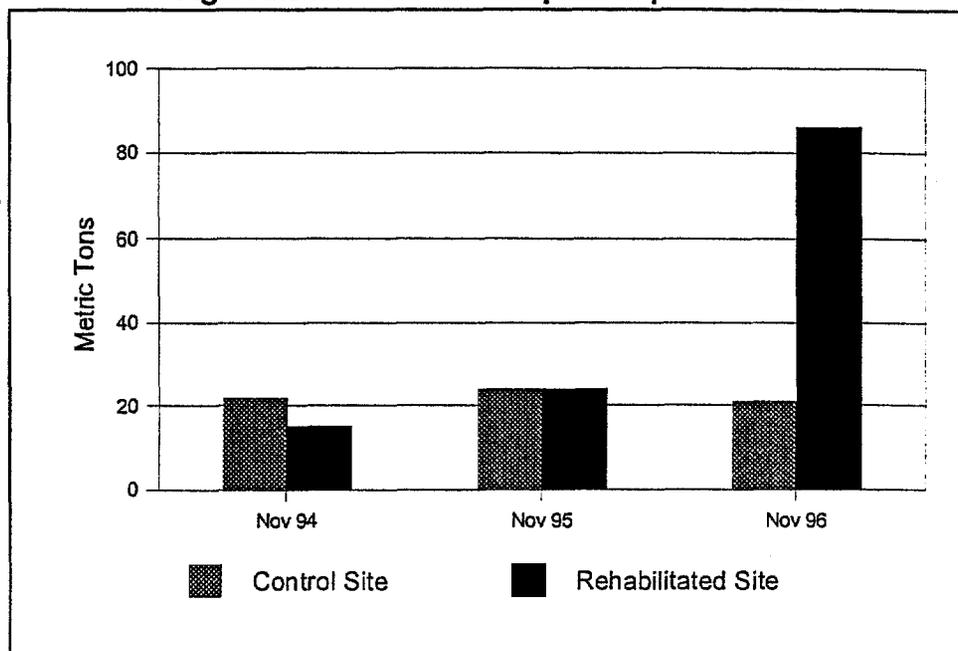
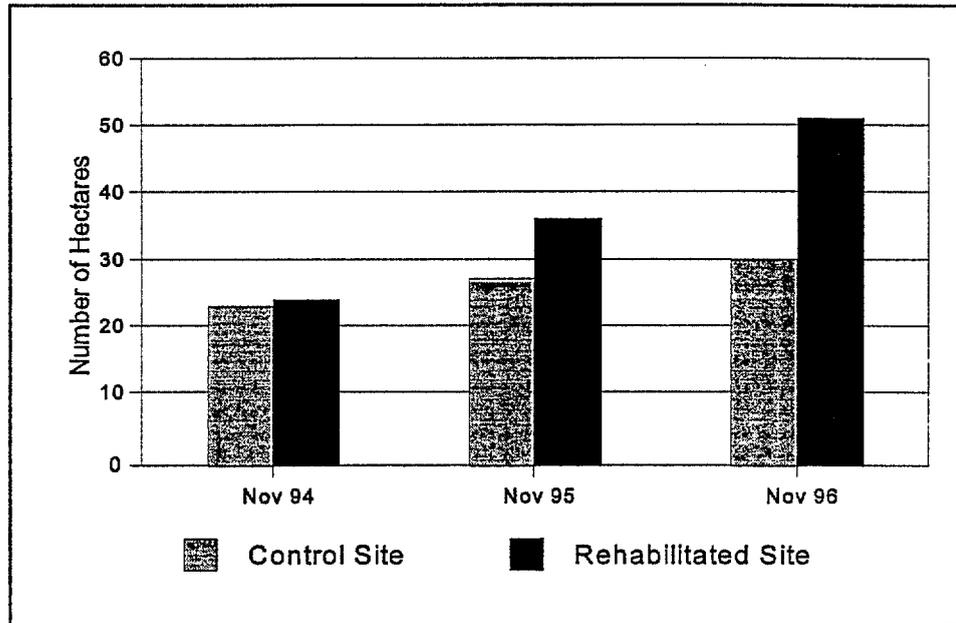


Table 14 shows that the area under cultivation with fruit crops has considerably increased (113 percent) on the improved sites, while it has increased by only 29 percent on control sites. In fact, the increase is not due to new plantations, but to old trees, abandoned for years, that are being harvested. In some subprefectures, such as Donghol-Touma, the inhabitants did not wait for the end of the roadwork to revive former plantations. The situation is the same in Vasséridou, where the authorities confirm that old plantations have been reactivated since the roads were improved. This explains the survey results: the increase in cultivated areas is not really due to new plantations, except in the area around N'Zérékoré, where the plantain plantations have multiplied.

TABLE 14
FRUIT CROPS CULTIVATED
(HECTARES)

	Number of survey sites	1994	1995	1996	Change
Control sites	18	23	27	30	+ 29%
Rehabilitated sites	22	24	36	51	+ 113%

**Figure 14
Fruit Crops Cultivated**

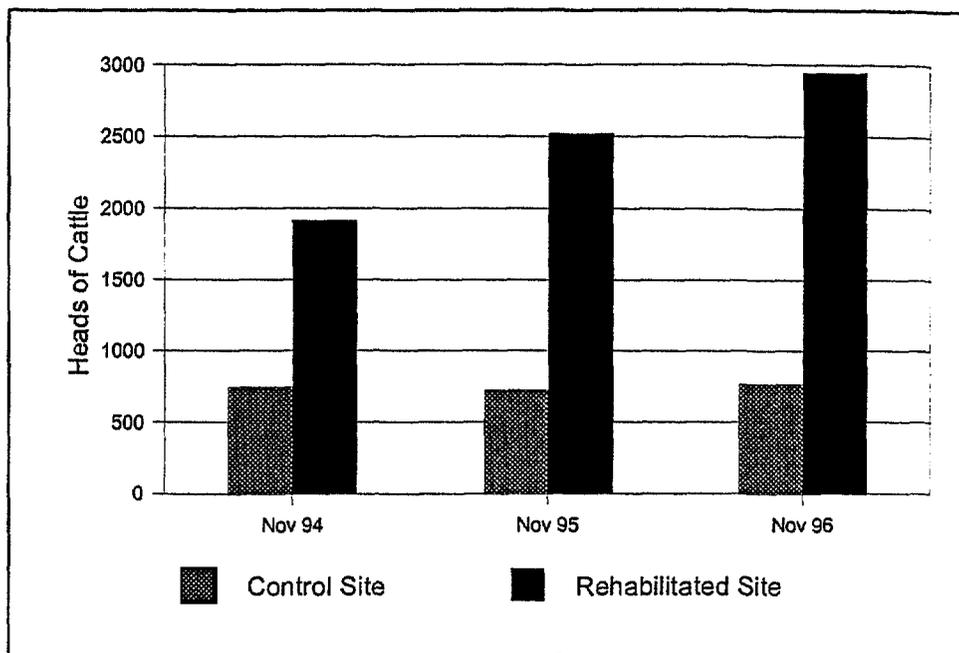


Based on Table 15, we may conclude that improving the roads has also had an impact on the size of cattle herds, since they went from an average of 1,921 heads to 2,941 heads in three years. During this same period, the number of cattle in the control sites was essentially unchanged.

**TABLE 15
CATTLE HERDS
(AVERAGE NUMBER OF HEADS PER SITE)**

	Number of survey sites	1994	1995	1996	Change
Control sites	18	751	730	770	+3%
Rehabilitated sites	22	1921	2526	2941	+53%

**Figure 15
Cattle Herds**

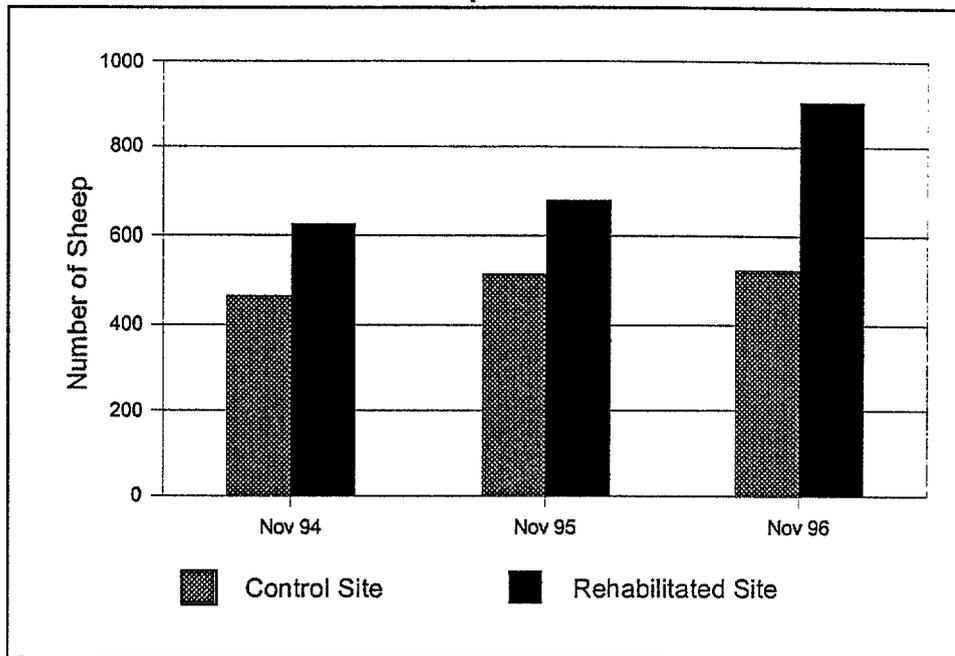


Based on Table 16, there seems to be a slight progression in the number of sheep raised along improved roads: a 45 percent increase over three years, compared with a 12 percent increase on the control roads. Observations in the field confirm these data. On certain improved roads, such as those between Faranah and Beindougou, sheep constitute a veritable traffic hazard, standing in the middle of the road, oblivious to passing vehicles.

**TABLE 16
SHEEP HERDS
(AVERAGE NUMBER OF HEADS PER SITE)**

	Number of survey sites	1994	1995	1996	Change
Control sites	18	467	515	526	+12%
Rehabilitated sites	22	626	679	905	+45%

**Figure 16
Sheep Herds**

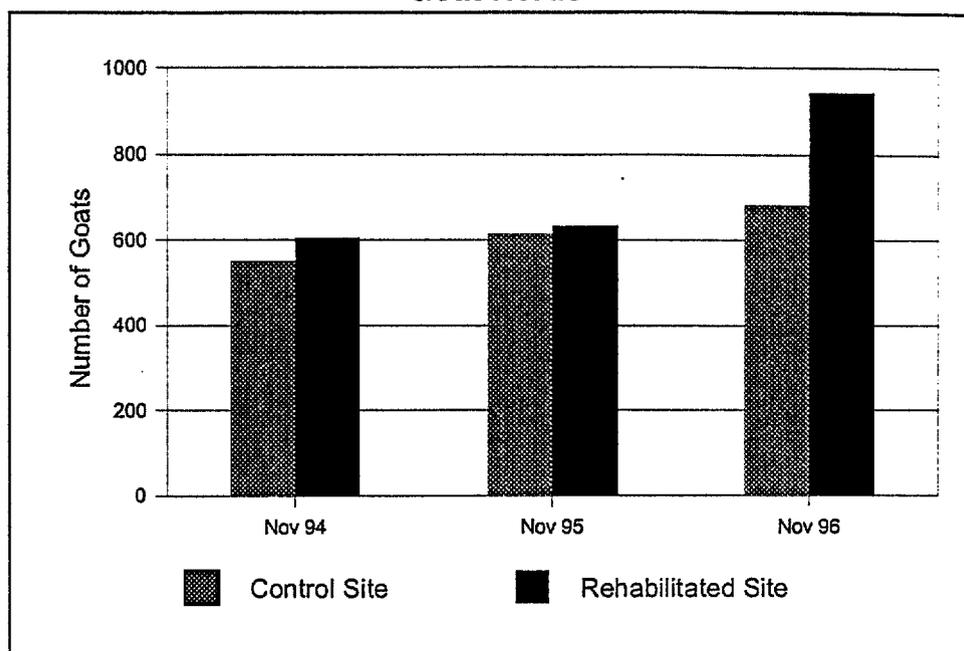


Cattle, sheep, and goat herds have increased by practically the same ratios over the last three years. On the control sites, goat herds have increased the most, with a 24 percent progression, compared with 12 percent for sheep and 3 percent for cattle.

**TABLE 17
GOAT HERDS
(AVERAGE NUMBER OF HEADS PER SITE)**

	Number of survey sites	1994	1995	1996	Change
Control sites	18	551	614	682	+24%
Rehabilitated sites	22	605	633	941	+55%

Figure 17
Goat Herds



The data concerning poultry are very incomplete, and are only based on a limited number of sites: nine the first year, two the second year, which could explain the increase, and eight in the third year, out of a total of 22 surveyed villages. We can thus not draw any conclusions.

TABLE 18
POULTRY

	Number of survey sites	1994	1995	1996	Change
Control sites	18	1,422	n/a	n/a	n/a
Rehabilitated sites	22	3,337	4,125	1,580	-53%

Figure 18
Poultry

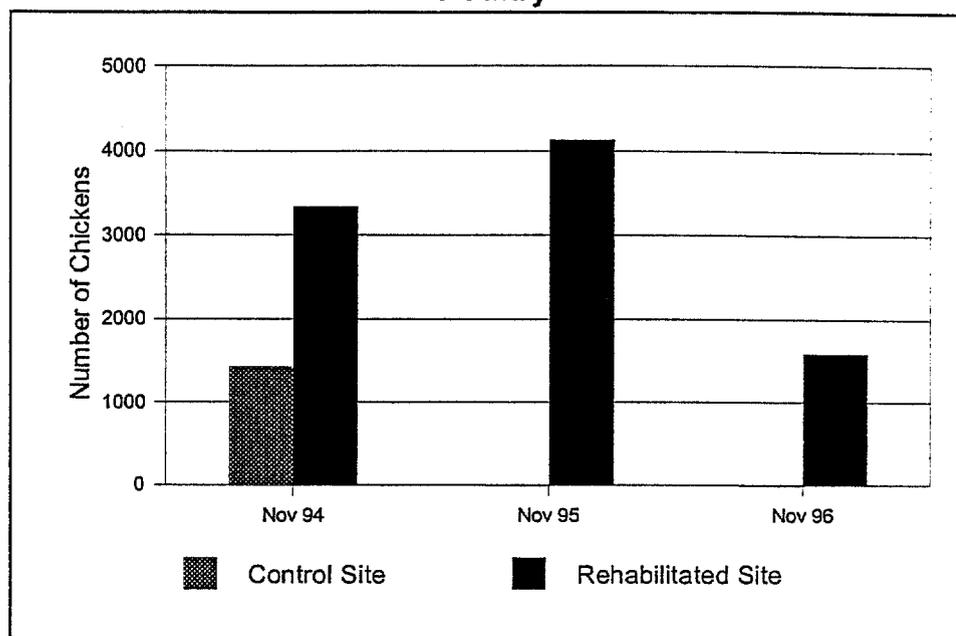


Table 19 shows changes in agricultural organization. Of the 22 villages surveyed, 41 percent were working with projects in 1995, compared with 68 percent in 1996. We have no data for 1994 to allow us to judge the number of organizations that existed before the roads were improved. The creation of cooperatives, nongovernmental organizations (NGOs), or projects requires time.

TABLE 19
THE ORGANIZATION OF PRODUCTION

	1995	1996	Change
No. of agricultural projects	41%	68%	+67%
No. of NGOs	23%	36%	+60%
No. of cooperatives	59%	82%	+38%
Input availability	18%	23%	+25%

The need for organization originates in response to the market. This theory is supported by the women of Porédaka, who say that: "In order to keep our crops from rotting, we are creating female production groups, because we produce sweet potatoes, tomatoes, peppers, and eggplant." The men have also created cooperatives "...with traders who come to pick up our crops in the village." In Hérico, the women have formed a cloth dyeing cooperative, and two leatherworkers have arrived. We can expect that all sorts of cooperatives will arise in the villages along improved roads.

Finally, it is interesting to note that the availability of inputs in those villages has already increased, going from 18 percent to 23 percent in the third year. But this percentage remains low, showing that agricultural technology remains essentially traditional. This reemphasizes how important it is for the Ministry of Agriculture to intensify its agricultural extension efforts in those areas where the roads have been improved, so that the intended objectives of the PNIR project are fully achieved.

CONCLUSION

The inhabitants of villages that are cut off by lack of passable roads only produce crops for subsistence. Any surplus rots for lack of buyers and means of transportation. Once their road has been rehabilitated, farmers take a new interest in farming fields and raising plantations that have long lay abandoned. They increase the size of their holdings. These impacts will only be felt over the long term, because it takes time and means to increase production. The data presented in the previous tables confirm this: They show the impact in the third year on both the area under cultivation (a 61 percent increase) and the amount of goods sold (a 469 percent increase). The increase in area under cultivation may seem limited, but improved roads are only one of many factors influencing agricultural production. Other important factors include agricultural services, the extension of new technologies, the availability of inputs, and access to agricultural credit.

There have been changes that reflect a change in farmers' attitudes. Many of the farmers sampled had promised to increase the area they cultivated as soon as one of their major constraints was solved: the impossibility of marketing their production. Already cooperatives and marketing groups are being formed, a sign that activity has increased and that farmers are committed to tapping the agricultural potential of their areas.

The road at the village of N'Zon in November 1994, before its rehabilitation.



In June 1996, vehicles can finally circulate, after many years without traffic.



4. SOCIAL IMPACT

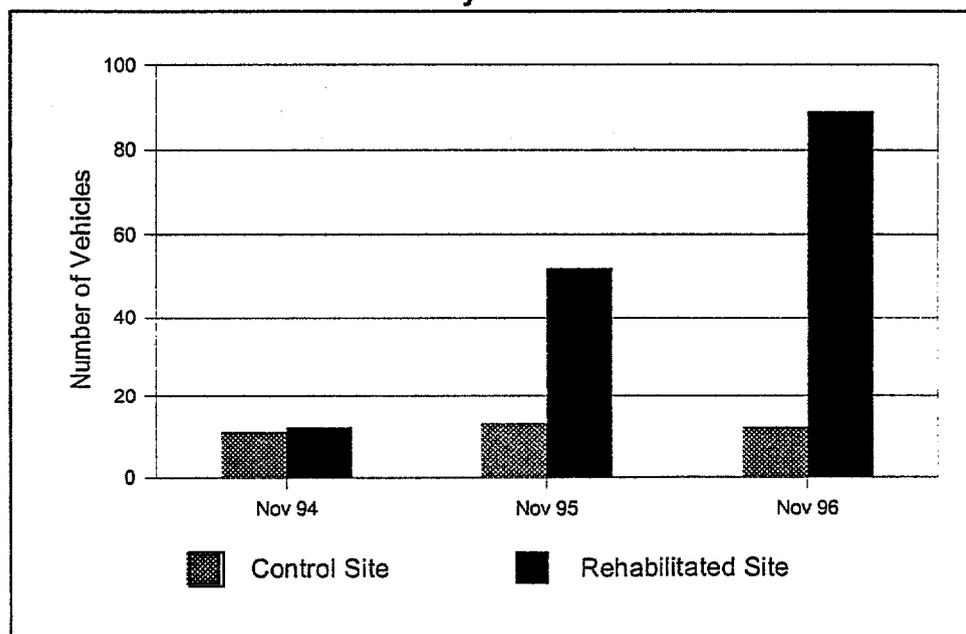
For this impact category, a certain number of indicators were selected, including daily traffic and indicators concerning markets, because these impact categories directly affect people in rural areas and the delivery of services.

Table 20 shows the importance of improved roads for rural people, since traffic increased sevenfold on the rehabilitated roads. This change is immediate, and fully corresponds to the intent of the PNIR project: linking isolated villages to the outside world. The increase in available transportation is one of the most appreciated changes in the villages. Many of the rural people sampled repeat the same litany: "Our lives are changing...the weekly market is very well attended...consumer goods arrive in sufficient quantities...childhood diseases can now be treated locally...our fruit and vegetable crops sell well...we may now participate in ceremonies organized in neighboring villages."

TABLE 20
DAILY TRAFFIC
(NUMBER OF VEHICLES)

	Number of survey sites	1994	1995	1996	Change
Control sites	18	11	13	12	+3%
Rehabilitated sites	22	12	52	89	+673%

Figure 19
Daily Traffic



A certain amount of data that are not directly quantifiable are important measures of the impact of the roads on the lives of rural people. These data compare the degree of people's frustration before the roads were improved to their degree of satisfaction after the improvements. The interviews of local authorities and the local people testify to that impact. Civil servants and local men and women are unanimous in deploring the lives they led before the roads were rebuilt. They consider their villages' isolation as the root of their problems, the basis of their deplorable socioeconomic conditions. They blame their total lack of basic services, such as health and education, and the fact that civil servants assigned to their villages do not stay at their posts, on being cut off from civilization.

The women of Malapouya do not hesitate to say that "...in our village, we are in the bush, our life is a calvary." The situation of sick people and pregnant women is particularly serious: "...should there be any delay, either the mother or the baby will pass away...sick people who are evacuated from the village pass away before reaching the hospital."

As a result, rural people are greatly discouraged. The inhabitants of Missira explain their situation in the following terms: "We all work a lot, but we must headload any crops we want to sell... crops rot in granaries for lack of transportation.... People stop growing for the market...the fields are abandoned."

In Tourkon, as bad as the men's situation is, the situation of women is worse: "Our people live mediocre lives...any development is blocked by the lack of roads...by the lack of means of communication...all services are paralyzed. The women work in the fields and in the kitchen...they bear an overwhelming burden."

Production is discouraged. Almost all the control villages surveyed reported that their crops were rotting because of the lack of passable roads. Or else, "...our production is diminishing because our crops are not purchased at markets...lots of crops spoil in the village, which discourages farmers." In Guéckédou, the farmers add: "Our crops rot, because no one wants to carry a sack of oranges on their head for 20 km. When we send a sack of coffee to market, we lose money...." Other villagers, such as those of N'Zon, add that: "We have abandoned our coffee and cocoa plantations because buyers no longer come to purchase our crops. All the problems of the village are linked to the state of the roads...the instability of teachers and nurses, the depopulation of our village, the poor condition of the huts...all commercial transactions are blocked, and all this is very discouraging for us...."

In Moribadou, the local people describe the sadness of their lives: "A village that has once known a road has a hard time surviving when that road is lost. Our village is completely run down...each year we witness the departure of families for other towns or other villages. We do not see or know of any government actions that benefit our inhabitants." They continue: "Because of our isolation, we have lost our subprefecture, our market, our school and soon we will lose our mosque...because our Imam has just left. We can only be compared to the beasts around us, because we too, live hidden in the forest."

In contrast, once the road is improved, village life is reborn, and basic services spring up again. The local authorities say that "...those functionaries who refused to come to their posts here, now come on a regular basis, and their salaries, which used to take three or four months to reach them, now reach them promptly."

The women of Donghol-Touma express this rebirth of village life in the following way: "Life is changing and we see the advantages of fixing the roads...our markets are now attended, we get enough

consumer goods...sick children can be treated locally, our garden crops are easy to market...we can participate in ceremonies organized in neighboring villages." The authorities confirm that "...opening the village up facilitated everything...this is a cause for joy...commercial transactions and trips are easy...foodstuffs no longer rot...both people and livestock are taken care of."

In another village, Kithiar, where the road has finally been improved, the inhabitants express their satisfaction: "Vehicles travel all year-round, commerce is flourishing, and visits are frequent.... We are satisfied at more than one level. If I need anything, I leave my hut, and a vehicle drops me where I want to go. I take care of my business, another vehicle picks me up and takes me back...all in three or four hours time, instead of taking days, like it used to." The farmers there say that "...buyers now find us in our homes, trucks are loaded near our fields...we no longer carry our crops to market on our heads...our health problems can be treated locally, and when they can't we don't waste any time waiting for transportation. We even produce crops that we don't consume...all we need to do is negotiate with a driver to have our produce picked up. Before, we used to plead with our clients, now they are the ones who are pleading with us." The men of Kithiar conclude: "This year will remain memorable for our farmers, because trucks came from Dakar to buy oranges and bananas, which allowed us to to earn more than 1,000,000 GF in a single day..."

In Malanta, the men profess their satisfaction in the following way: "We are very comforted...we used to have to carry our sick people in hammocks, climbing up and down hills and mountains for days before reaching Gaoual...now we can find a vehicle in the subprefecture and be in Gaoual in four or five hours... there are no longer any difficulties transporting construction material and the vehicles no longer break down or get into accidents." The women of Malanta also manifest their joy: "The road improvements were a great treasure for our people. We used to walk 60 to 80 km to Touba to get a vehicle for Gaoual. Today, people can get a ride in Malanta or in any village, with a decrease in fares...passengers fares have gone from 10,000 GF to 7,000 GF. A single vehicle used to come once every two months, now we see three and four vehicles per week." Some former residents now come in their own passenger cars to visit their relatives, which was impossible before the roads were improved.

As far as services are concerned both the authorities and the local people confirm that there have been many changes: "The PASE project [Education Sector Adjustment Project] constructed a school with three classrooms...and the CEE helped build a health clinic...the number of stable functionaries has increased and SNAPE [National Rural Water Service] has increased the number of wells...family visits and trips have been made easier."

In Termessé, the subprefectoral authorities indicate that the road improvements allow inhabitants to benefit from better services through the presence of civil servants: "For the time being, all the functionaries are where they should be...." Men and women have noticed how easy it is for veterinary agents to come and vaccinate cattle and how easily the health clinics are supplied with pharmaceuticals.

Health workers themselves "...can now get to other villages for vaccination campaigns." As the authorities say: "Before the roads were redone, any government agent sent to Termessé considered themselves to be punished by the civil service. They either did not go where they were posted, or they went very reluctantly. Now all the agents are at their job sites."

As for the schools, there is now contact between the Prefectoral Service for Education and the schools, easy transportation of schools supplies, the construction of new classrooms, and an increase in attendance: "The increase in the number of classes has stimulated the enrollment of our children in school."

In Hérico, "...the masons and the carpenters and certain citizens who had left the village, have now come back to stay and are looking for land to build on. So far, three masons and two carpenters have come back to the village." The local authorities are sensitive to the economic growth of the village: "This year, we recovered the minimum tax in a single month, whereas in past years, it took 6 to 10 months to gather the village tax."

This growth is present in every improved site. In Porédaka, the people manifest their satisfaction in the following way: "Now, we find everything we need in our village. We can go into town (Mamou) at any time. The population and the amount of services have considerably increased. Porédaka has become nearly a town, thanks to the road. What's more the road has allowed other villages to open up feeder roads in order to gain access the outside world...." The change is also evident in the social life and leisure activities of the village, and particularly benefits the youth of the village: "The young people have constructed dance halls where they organize social activities. We now have video-clubs. Before, our kids had never even been to the movies."

In N'Zon, the village authorities have noticed a clear change in the quality of life of the village people: "When we saw the first heavy equipment, there was a celebration in the village. Before that, our village was deserted, but since the road was improved, new families have come to the village, and all kinds of activities are now possible."

As far as agricultural production is concerned, the village authorities say that farmers have expanded their rice fields and have agreed to begin large coffee and banana plantations, because "...they now can easily sell their crops for good prices." Another notable change has been that "...since the road was fixed, our village has gotten a well, which has improved our dietary situation. What's more, our school has gone from two classes with two teachers, to four classes with four teachers. Videos and stereos provide entertainment for our young people."

The authorities in Moribadou declare that "...we are now easily able to get to our villages for any type of problem. We've begun to see villages that all but disappeared come back in the same place; the commercial exchanges that existed between Macenta and Konsankoro have started up again. The flow of agricultural commodities has become easier and more intense. The communications network has become faster."

The villagers of Moribadou are delighted that their road is a thoroughfare, one that will develop their village. Konsankoro is a true crossroads between Upper Guinea and the Forest Region. As the inhabitants say: "Before the road was redone, we never heard an engine up here. Now, each day, a number of vehicles go by, and we no longer have any problem getting our sick people to Macenta or Kérouané. Our quality of life is improving."

There is a massive influx of people who are returning, and that population increase is being felt. The village market, long in disuse, is now active again. The divorce rate, which was very high, has stabilized and

extended families are consolidating. The men say that "anyone who did not see the road before work began, cannot imagine its current condition."

The women of Moribadou are also happy about the state of the road, since they will no longer be victimized by unwanted divorces. They can engage in market activities that increase the quality of their lives: "We no longer lose our harvests, everything we produce earns us money. Pregnant women now can get to the health clinic and no longer die in cases of difficult childbirth." They confirm that life is changing and they are beginning to notice the advantages of the road: "All the markets that were abandoned are now back in activity and goods arrive in sufficient quantities; childhood diseases are now treated right here. Garden produce is easy to sell and we can now participate in ceremonies in other villages."

Transportation providers say that passenger fares over a distance of 37 km have gone from 600 GF to 400 GF, while the cost of hauling a ton of merchandise has dropped from 6,000 GF to 4,500 GF. A driver who uses this road declares that he hasn't suffered any breakdowns due to the condition of the road. The commodities he transports are rice, millet, peanuts, manioc, palm oil, bananas, peppers. As far as traffic is concerned, "...there used to be hardly any vehicles on this road, except for a few rare trucks that could push through, because all the others always broke down."

Now there are hundreds of vehicles of all kinds: passenger cars, light trucks, heavy trucks, tractors, buses. Farmers no longer have any problems marketing their crops: "Ever since the road came through, traders find us in our homes, trucks are loaded near our compounds and we no longer headload our crops to market. Our plantations that were abandoned are being rehabilitated." All the markets that were abandoned along the road have started up again. Vendors come from Kérouané, Macenta, and Banankoro, with many different types of goods. Incomes have increased because goods sell rapidly and bring in cash.

In Missira, the authorities say that "...we have access to at least one commercial passenger vehicle per day, and on market day, many vendors come from Téliélé. Now, there are no longer any handicaps. The Yangalé and Donzo bridges are very well built, whereas they were a major obstacle to any traffic between Koba and Missira before January 1996." The men in the village concur: "There have been so many changes over such a short period of time since the Koba road was fixed...especially as far as markets are concerned. The farmers no longer come home with unsold crops, they sell everything, because the demand is heavy." In discussing schools, the village men express their desire to build new schools in the Koba subprefecture: "There's a noticeable amount of progress in school enrollments...and a general satisfaction about the ease of travel."

For the authorities in Tourkoun, their village is now a major crossroads, a commercial center where vehicles from all over congregate: "On the road from Kambaya to Sogolon, there used to be only one or two vehicles at the weekly market, now there are dozens of small trucks, minibuses, and semis." The women along the Kambaya to Sogolon road state that "...the improvements have solved several problems... we used to carry loads on our heads for about 43 km, now minibuses travel up and down the villages looking for freight and passengers...there has been a marked improvement in women's lives in general in our villages." One happy outcome has been what the women describe as "...the appearance of new things, especially women's fashions...and then there's the influx of new people towards the beach at Sinta, among other benefits of the road to our villages."

The women of Tourkoun say with pride: "Our incomes have begun to improve, our faces are happy and we can now have regular medical treatments." The transportation providers are happy as well. One driver who drove between Téliimélé and Missira (93 km) claims that "...despite the fact that fares have decreased, I can drive very quickly and without any breakdowns. I can tell you that I now make between three and four trips a week...."

Overall, the changes brought about by the improved roads are very positive. For the rural people, the beneficial effects of road improvements are already being felt, because producer prices have increased, which has the corollary effect of lowering passenger and freight transportation fees. At the socioeconomic level, rural peoples' mobility has been enhanced, and construction materials are available at competitive prices at all times, "without forgetting that farmers' incomes are going to improve over several years because of an increase and a diversification in yields and lowered production costs."

Changes in agricultural production are shown by the fact that "...the areas that are cultivated this year considerably exceed those of previous years. Several people have converted to growing crops because of the high demand for foodstuffs." As to agricultural marketing, "...one can already note a high demand as compared with supply, which has encouraged a rise in prices for agricultural products. This is seen throughout the markets of Koba." As far as services are concerned, "...communication between the prefectures and formerly isolated subprefectures is now very easy. For example, the health services are better used and evacuating sick people to Téliimélé or other places has become a common practice. Nowadays, the functionaries are regularly in Koba."

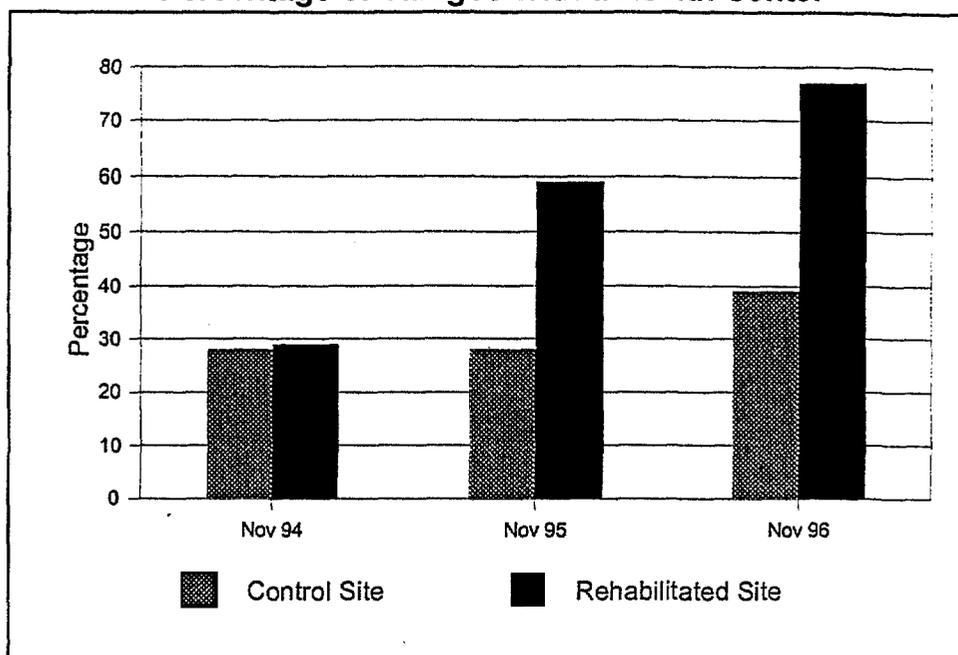
All of these quotes reveal the degree of people's satisfaction and show the positive impact of the improved roads on the people involved, thus completing the quantitative data used to measure that impact.

As shown in Table 21 and Figure 20, only 29 percent of the villages along improved roads had a health center before the improvement; 3 years later, 77 percent had a health center

TABLE 21
PERCENTAGE OF VILLAGES WITH A HEALTH CENTER

	Number of survey sites	1994	1995	1996	Change
Control sites	18	28	28	39	+ 40%
Rehabilitated sites	22	29	59	77	+ 170%

Figure 20
Percentage of Villages With a Health Center



Similarly, only 34 percent of villages had wells for drinking water before the road improvement, compared with 86 percent 3 years after improvement.

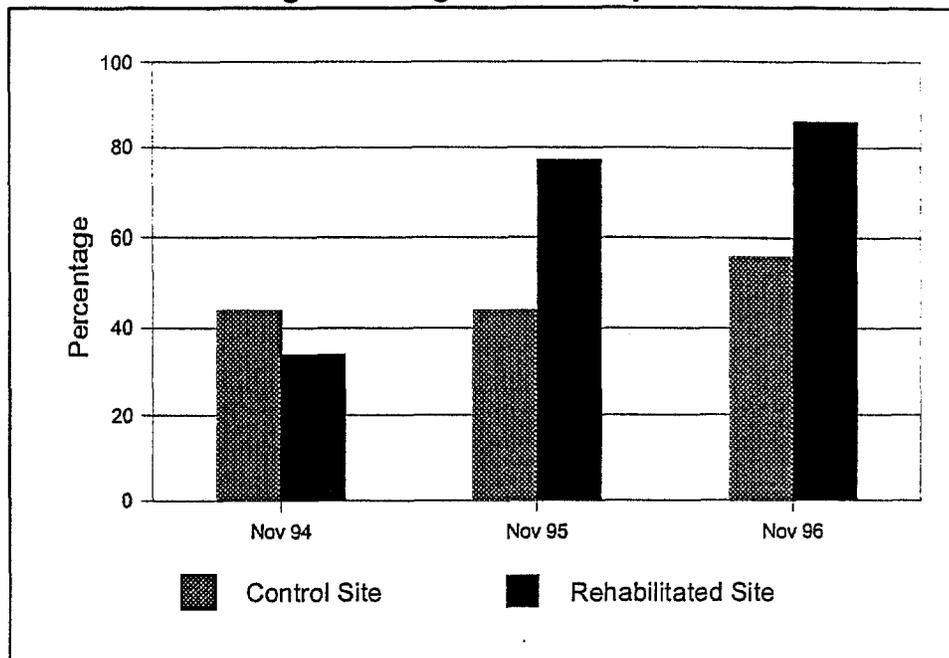
The absence of drinking water greatly affects rural people. At Samba Barry, for instance, the local people say: "In the dry season, our women and children often walked 5 km to bring back drinkable water, since SNAPE couldn't get their heavy equipment in here to drill a well. Our only friend is he who will help us get fresh water and who will fix the road." It is the lack of roads that most often prevents the SNAPE agents from accessing those villages that are the most needy as far as water is concerned. The SNAPE agents from the Malanta subprefecture for example, recognize that "thanks to the road, 28 wells have been drilled in the subprefecture."

In Kithiar, the authorities affirm that "fixing the road has allowed SNAPE to sink wells in several villages, to the great satisfaction of the locals." Table 22 shows the progression in the number of wells, as a direct result of improved rural roads.

TABLE 22
PERCENTAGE OF VILLAGES WITH DEEP BORE WELLS

	Number of survey sites	1994	1995	1996	Change
Control sites	18	44	44	56	+25%
Rehabilitated sites	22	34	77	86	+152%

Figure 21
Percentage of Villages With Deep Bore Wells

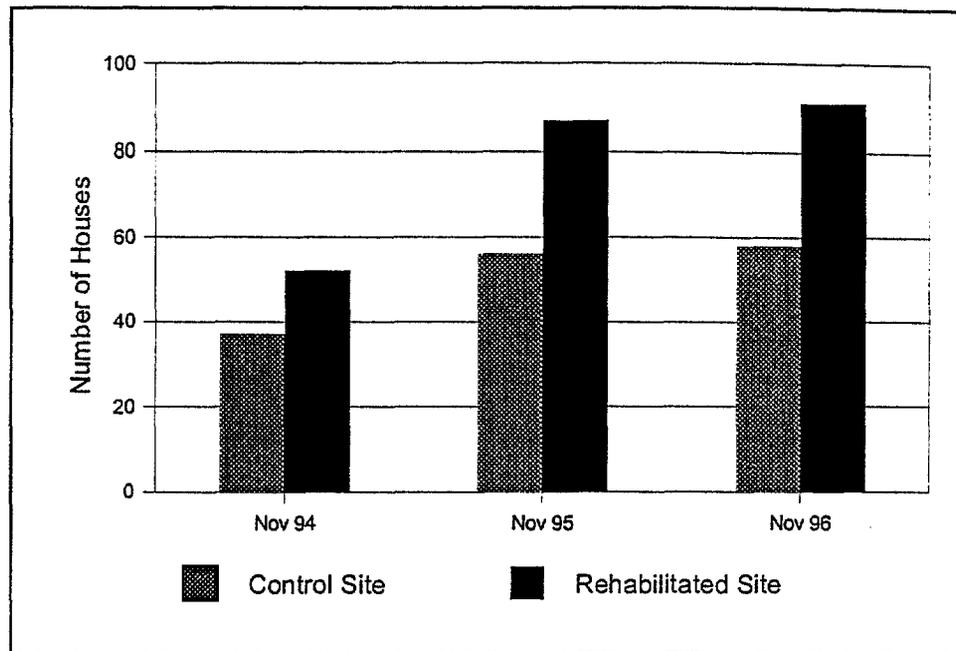


Another indicator of the significant impact of the roads is the number of houses covered with tin roofs. In less than 1 year, this percentage has increased by 46 percent. Over 3 years, it increased by 76 percent. On the average, more than 30 new houses received tin roofs, while it took years for the 66 houses in the original sample to tin their roofs. The general habitat of the affected villages is improved, because it is finally possible to bring in construction materials.

TABLE 23
NUMBER OF HOUSES WITH TIN ROOFS

	Number of survey sites	1994	1995	1996	Change
Control sites	18	37	56	58	57%
Rehabilitated sites	22	52	87	91	76%

Figure 22
Number of Houses With Tin Roofs



As the authorities in Kithiar mention: "...some farmers are already building block houses. Trucking in construction materials has become a lot faster." This shows an immediate positive impact of fixing the roads, and provides an indication of the improvement in the quality of rural peoples' lives.

TABLE 24
INDICATORS SHOWING IMPACTS OF ROAD IMPROVEMENTS ON RURAL PEOPLE

Type of data	1994	1995	1996	Change
Weekly traffic	12	52	89	+637%
Transportation time	8 h	3 h	1 h30	-84%
Transportation costs (per passenger)	3,415 GF	2,270 GF	1,818 GF	-47%
Transportation costs (per ton of merchandise)	37,750 GF	22,579 GF	16,841 GF	-52%
Average market stalls (per village)	60	68	93	+54%
Vendors in markets	23	32	34	+48%
People in markets	1,017	1,770	2,673	+163%
Percentage of villages w/health centers	29%	59%	77%	+170%
Percentage of villages w/classrooms	46%	86%	95%	+109%
Percentage of villages w/wells	34%	77%	86%	+152%
Houses roofed w/tin	52	87	91	+76%

CONCLUSION

The impact of the road improvements on rural people is positive on many levels: Services have significantly expanded now that civil servants are present in the villages they have been assigned to. People have better access to health care and education for their children; 77 percent of the villages along improved roads now have a health center, compared with 29 percent before the roads were redone. Ninety-five percent have schools (compared with 46 percent before) and 86 percent have access to drinking water (compared with 34 percent before). The village women particularly appreciate these improvements, since they bear much of the responsibility for village life. Commercial transactions have multiplied, and weekly traffic has increased sixfold. Travel has become much easier, transportation time and costs have clearly decreased. These are all elements that are appreciated by the local people. The women of Moridabou sum up the situation when they say that "...we now have an easy time getting to our villages in case of any problems. We have begun to recognize villages that had disappeared and have now reappeared in the same place as before. The commercial links between Macenta and Konsankoro have sprung up again. The marketing of agricultural commodities has become easier and more intense."

In all the sample villages, the women express great satisfaction in seeing their lives reborn after many years of frustration and abandonment. They now can hope that their lives will be easier in the future: "We no longer lose our harvests, everything we produce earns us money. Pregnant women can now get to a health center and no longer have to worry about dying of complications during childbirth."

5. IMPACT ON SMALL AND MEDIUM ENTERPRISES

This impact is measured essentially by comparing the number of SMEs that respond to the request for bids by the DNGR, the number of actual bidders, and the number of contracts signed with the DNGR. Another important aspect is the training provided to the SMEs, especially by the UME, in order to increase their capacity to respond to bid proposals and to undertake road and bridge work. The PNIR project planned to track the development of national SMEs in order to progressively ease them into an important amount of civil engineering work. For this purpose, the DNGR created a support and training unit for the SMEs, known as the DAP, which was adapted to the rural engineering program. The DAP unit has three basic functions:

- ◆ on an external level, the DAP facilitates relations between the SMEs and the administration and suggests changes in rules and regulations concerning contracts and bidding. It also sensitizes donors to the needs in the SME sector, especially in regard to equipment and training;
- ◆ on an internal level, the DAP supports the SMEs by providing them with technical as well as management training support. Significant progress has been achieved in this area. More than 130 SMEs are currently in contact with the DAP, and 80 have benefited from training and technical assistance;
- ◆ on an operational level, the DAP depends on the UME, whose purpose is to ensure the technical training of private contractors; the Dubréka pilot project, which trains SMEs in the techniques of labor-intensive (HIMO) work; and on private trainers for management and business management training.

5.1. IMPACT

In 3 and a half years, more than 120 private civil engineering firms have received SME training. Technical and entrepreneurial training for private contractors was provided for more than 80 SMEs. As far as pedagogical tools are concerned, 11 documents have either been published or are being finished.

The DAP has been insitutionalized inside the DNGR for the length of the PNIR project. At the operational level, this cell involves the UME and the BIT/HIMO component. Since 1994, this component has been given priority.

The SMEs' training needs were identified based on the SME database, which now lists more than 115 SMEs. Thus, during 1994, 60 percent of the training volume was directed towards SMEs and subcontractors. One hundred ninety-two SME managers and technicians and 102 subcontractors benefited from this training.

5.2. THE UME

The institutional impact of the PNIR project is demonstrated by, among other factors, the creation of the UME in 1991. The purpose of this mobile training unit is to train and upgrade the skills of public and private-sector technicians and engineers in the domain of rural infrastructure. In the context of the project, more than 1,000 km of rural roads were reserved for Guinean SMEs. However, most new or even existing SMEs did not have the necessary competencies to:

- ◆ respond appropriately to requests for bids;
- ◆ carry out the work normally and efficiently; or
- ◆ build roads or bridges according to technical specifications.

In the same way, the DNGR, as the construction supervisor, did not have a technical background in building rural roads and infrastructure that was sufficiently adapted to the Guinean context. The DNGR's technicians did not have the necessary background to create blueprints that were sufficiently precise. The UME was thus given the responsibility for:

- ◆ training SME employees to analyze bid specifications and to properly submit bids for rural roads and infrastructure;
- ◆ training foremen and construction supervisors in rural road engineering;
- ◆ training construction team leaders for infrastructure work; and
- ◆ training DNGR personnel in roadbuilding techniques and construction supervision.

As soon as it was created, the UME found itself confronted with the problem of significant cost overruns by the firms that had bid on the initial set of road lots financed under the PNIR project. A viable alternative to this situation needed to be found. Furthermore, the DNGR personnel in charge of evaluating those bids had no adapted technical or reference materials. A seminar was organized in Mamou, which produced a "Manual on Rural Roads, for Engineers, Planners, Supervisors, and Trainers." This manual was published in November 1991. It describes the standards for finished rural roads, for road improvements, and for preliminary work. It includes blueprints of typical road profiles, and a price matrix for terracing work.

The first training sessions for the DNGR employees began in 1992. A total of 95 trainees participated, for a total of 20 man-weeks. Two training sites were opened: one on the Mamou-Farinta road, the other on the Fougoumba-Porédaka road.

In 1993, two workshops intended for local SMEs were held, with the participation of 22 trainees, for a total length of 12 man-weeks. Forty-three trainees from the DNGR also received 11 man-weeks of training. These on-the-job training sites produced the following results:

- ◆ the improvement of the Kaala road (6 km);

- ◆ the improvement of a bridge spanning 4 m;
- ◆ the construction of a bridge spanning 5 m; and
- ◆ the installation of an arch drainage pipe.

In 1994, a total of 25 employees of 25 different SMEs were trained by the UME. Furthermore, the improvement of the Mamou to Horé-Mamou road was finished by subcontracting to Cochéry.

TABLE 25
TRAINING PROVIDED BY THE UME IN 1994

Participants	Number of participants	Man-weeks	Cost (GF)
SMEs	66	274	81,380,689
NGOs (AFVP)	53	134	4,216,432
DNGR	27	81	1,977,300
Total	146	489	87,574,421

In 1995, the UME opened three rural road training sites and three civil works training sites. Theoretical training was provided to 33 trainees for a total of 12 weeks. Practical training was attended by 25 trainees for a total of 15 weeks. The details of this training are listed in Tables 26 and 27.

TABLE 26
THEORETICAL TRAINING PROVIDED BY THE UME IN 1995

Type of training	Number of trainees	Length in weeks	Total cost in GF
Road foremen and crew chiefs	12	5	3,192,400
Bridge construction crew chiefs	10	2	1,960,750
Analysis of RFPs and bid submissions for roads	7	3	1,712,800
Analysis of RFPs and bid submissions for bridges	4	2	1,287,200
Total	33	12	8,153,150

TABLE 27
PRACTICAL TRAINING PROVIDED BY THE UME IN 1995

Type of training	Number of trainees	Length in weeks	Total cost in GF
Foremen and construction crew chiefs	12	6	4,278,000
Bridge crew chiefs	7	6	32,862,500
Practical training in road techniques	6	3	60,000,000
Total	25	15	97,140,500

In 1995, the UME published a manual on hydro-agricultural improvements, and a guide to the maintenance of rural roads. The UME participated in and contributed to the institutional impact of the PNIR project by building the DNGR's and the SMEs' capacity to improve rural roads throughout Guinea. The number of SMEs that are interested in participating in this training is on the increase, since the training improves their ability to respond to requests for bids.

Table 28 shows the total number of trainees from SMEs who have been trained by the UME since 1992. A total of 122 SME representatives were trained by 1995.

TABLE 28
TOTAL NUMBER OF SME TRAINEES TRAINED BY THE UME

Type of training	1993	1994	1995	Total
Foremen	13	10	12	35
Road bids	13	10	7	30
Rural works bids	-	-	4	4
Rural works supervisors	-	43	10	53
Total	26	63	33	122

Table 29 shows the number of SMEs that responded to the DNGR's training proposals. In 1994, the DNGR used radio messages to advise the SMEs of the upcoming training program, asking those who were interested to come and fill out an application. One hundred thirty-six SMEs responded. This number indicates the interest that the SMEs have in this institution. The training that the SME employees receive from the DNGR through the UME allows them to be more competitive and to develop their businesses. A few SMEs, such as Guiter, were able to take full advantage of the DNGR's support and become very competent companies. Guiter's work is completed on time despite administrative red tape, their quality of work is comparable to that of the largest companies, and they even have recruited two active technical assistants.

TABLE 29
SMEs REGISTERED FOR TRAINING WITH THE DNGR

Year	Number of SMEs
1994	136
1995	139
1996	169

Despite the training that has been provided to date, a number of problems remain, particularly:

- ◆ poor planning and poor organization of work;
- ◆ a lack of capacity to create blueprints from surveys, and to carry through from that stage to the execution of work;
- ◆ a lack of financing and equipment. Most SMEs don't have sufficient capital to start construction work, and the lack of equipment causes major delays; and
- ◆ general incompetence in the area of billing, resulting in delays in payment to companies that already have cash flow problems.

Another element that indicates the positive impact of the PNIR on SMEs is the number of contracts SMEs have signed with the DNGR. Table 30 shows that since 1991, a total of 176 contracts were signed, for a total amount of more than 3 billion GF. The number of contracts between the DNGR and SMEs varies from year to year. In fact, a number of contracts that were signed in 1992 were filled in 1993, or even in 1994, which explains the low number of contracts signed in 1993 and in 1995. These delays in executing contracts were caused by a number of different factors, including:

- ◆ the nonperformance of SMEs in the first years of the project;
- ◆ delays in funding 1992 contracts;
- ◆ hesitancy on the part of banks to extend loans necessary to pay guarantees; and
- ◆ delays in paying the SMEs and administrative red tape.

TABLE 30
CONTRACTS FOR COMMUNITY ACTION SIGNED WITH SMCs

Year	Number of Contracts	Contract amounts (in billions of GF)
1991	6	105.702
1992	98	1,961.457
1993	9	248.926
1994	51	1,201.460
1995	9	240.948
1996	3	92.000
Total	176	3,860.490

CONCLUSION

The impact of the project on SMCs is far from negligible. Not only has their number increased, but their business base has expanded, and the training that SMC employees have received has allowed them to better respond to bid solicitations by the DNGR on rural roads contracts. A number of problems remain, and only a few companies are truly competent. The 1995 report noted that "the efforts of the UME should be directed in the future towards the organization of work sites, the creation of blueprints, as well as towards billing and attachments, which are all crucial points currently lacking that provoke considerable delays in execution." In November 1996, this observation was still appropriate.

The old and the new bridges at the entrance to Laine on the Lola-Foumbadou road.



The entrance to the village of Koro, on the Koule-Makposou road, in June 1996



S2A

6. INSTITUTIONAL IMPACT

The institutional impact is measured by the DNGR's capacity to establish and develop an effective rural roads and bottomlands improvement program. The capacities acquired by the DNGR thanks to institutional support provided by the World Bank, French technical cooperation, and USAID in the context of the PNIR project are evidenced by the following accomplishments:

- ◆ the publication of general studies;
- ◆ the compilation of competitive bid solicitations;
- ◆ the awarding of contracts;
- ◆ the supervision and monitoring of work performance;
- ◆ the rural roads master plan; and
- ◆ the establishment of an impact monitoring and evaluation system.

This support was financed for the most part by the World Bank, and, to a lesser degree, by French technical assistance. This institution building occurred at five different levels:

- ◆ technical assistance;
- ◆ training;
- ◆ support of SMCs;
- ◆ office construction and renovation; and
- ◆ infrastructure and equipment.

6.1. DNGR STRUCTURE

The DNGR is a technical branch of the Ministry of Agriculture, Water, and Forests. Its principal mandate is to:

- ◆ define a global rural engineering policy;
- ◆ ensure the provision of necessary infrastructure and equipment to modernize the rural environment and maximize the use of agricultural resources;
- ◆ define and implement a training and retraining program for its own personnel;
- ◆ promote the development of small and medium enterprises;
- ◆ oversee the rural engineering components of rural development projects; and
- ◆ obtain the financing necessary to accomplish these various objectives.

This mission is the result of policy reforms that have been in effect since 1984 concerning the disengagement of the state, privatization, and administrative reform.

In terms of organizational structure, the DNGR is represented at the central, regional, and prefectural levels.

The central level includes five divisions:

DEVTECH

- ◆ Studies and Planning (DEP), created in 1994;
- ◆ Roads and Rural Constructions;
- ◆ Hydro-Agricultural Works;
- ◆ Agricultural Machinery; and
- ◆ Maintenance, created in 1995;

two support services:

- ◆ the Administrative and Financial Cell; and
- ◆ the Technical Support Service (STA);

and two dependent services:

- ◆ the Logistics Base of Matoto; and
- ◆ the Center for Agricultural Machinery Training (CEPERMAG).

The regional level is made up of nine dependent services:

- ◆ eight Rural Engineering Technical Offices (BTGRs) located in Boké, Faranah, Guéckédou, Kankan, Kindia, Labé, Mamou, and N'Zérékoré, all created in 1991;
- ◆ the mobile training unit (UME) at Mamou, which was established in 1991.

The prefectoral level is made up of the Prefectoral Sections for Rural Engineering (SPGR), which are integrated into the Prefectoral Directorates for Rural Development and the Environment, with the exception of the Guéckédou, Kissidougou, Kouroussa, and Siguiri prefectures. Plans to create those four missing SPGRs, along with sections concerning mangrove agriculture improvements in the BTGRs of Kindia and Boké and local adjustments at the central level, were submitted to the Ministry of Reform and Public Administration in 1995 and are currently under consideration. The DNGR's personnel and that of its dependent services number more than 900 individuals. Table 31 provides a breakdown of those personnel by hierarchy and organizational affiliation.

TABLE 31
DNGR PERSONNEL

Hierarchy	Central level	BLM	BTGR	UME	CEPER-MAG	SPGR	Total
A	85	2	126	8	8	185	414
B	12	4	43	10	7	221	297
C	2	2	18	3	3	21	49
Subtotal	99	8	187	21	18	427	760
Temporary contractors	10	0	0	0	0	0	10
Permanent contractors	42	28	56	20	5	0	151
Total	151	36	243	41	21	423	921

Beginning in 1989, the DNGR began investing its time to establish clearly defined job descriptions. In addition to these considerable efforts, the DNGR has concentrated on human resources development management and has developed a computerized personnel information system with the support of USAID's 218 project.

6.2. TECHNICAL ASSISTANCE

Institutional support to the DNGR in terms of technical assistance has been quite considerable, since it represents 894 man-months. Sixty-nine further man-months are planned before the end of the PNIR project. This means that the total level of technical assistance planned under the project amounts to 963 man-months. The distribution of this technical assistance and the sectors of intervention are presented in Table 32.

TABLE 32
TYPE AND ORIGIN OF TECHNICAL ASSISTANCE

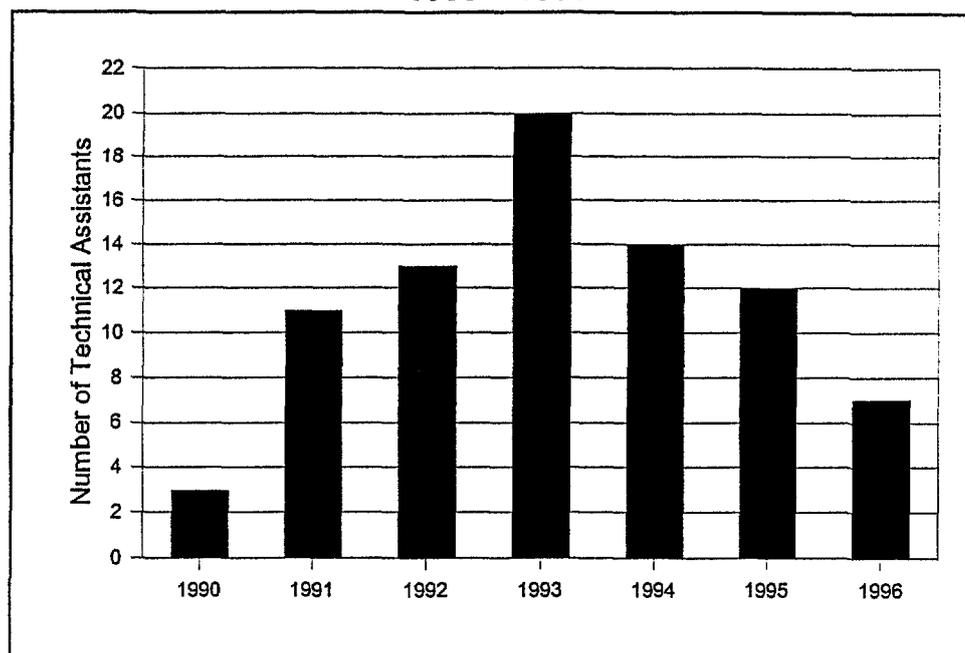
Area	Technical Assistance	Man-Months Used	Man-Months Remaining	Trainees
Institutional support, technical advice, coordination	French Cooperation	154	14	DNGR
Work supervision	Louis Berger	159	0	Road lots
Studies, preparing documents	Tractebel	247	1	Road division BTGR
SME support	Pellemon and French Cooperation	74	0	Training cell - UME
Financial management	BDPA	49	6	DNGR, CAF, BTGR
HIMO pilot project	ILO	76	29	SMEs, NGOs, BTGR
BTGR support	BDPA	5	19	BTGR
Support to bottomland developers	AFVP	36	0	Subcontractors, BTGR, SPGR
Monitoring & evaluation	DevTech Systems, Inc./ USAID	32	0	DNGR, BTGR
Training	Various	62	0	SMEs, BTGR, SPGR, DNGR, UME
Total		894	69	

The institutional support to the BTGRs was provided by one technical assistant for every two BTGRs in each of the natural regions. This support will also be provided to several SPGRs that are distant from regional centers but nevertheless have important improvements scheduled. This support has allowed the DNGR to increase its capacity in the planning, scheduling, monitoring and evaluation, and supervision of rural road improvements and hydro-agricultural engineering.

The number of technical assistants has greatly increased over the life of the project, as shown in Figure 23. It increased from 1990 to 1993, in response to the beginning of roadwork and the training of local teams.

From 1994 on, the number of technical assistants decreased as national technicians began to take over. By November 1996, there were fewer than 10 full-time technical assistants at the DNGR.

Figure 23
Technical Assistance to the DNGR
1990 – 1996



6.3. TRAINING

The training plan's objective was to build the DNGR's and private contractors' capacities to design, carry out, and monitor rural infrastructure programs. These training activities were intended to improve the skills of and to motivate all the DNGR staff, at the central as well as the local levels. The DNGR's training cell is responsible for planning, organizing, and implementing this plan. The cell remains streamlined, since it consists of three civil servants and a technical assistant. Since 1994, the cell has housed the SME support cell (DAP), and is in charge of coordinating the DAP's activities. The training plan includes training in Guinea by local organizations, as well as on-site trainers and participant training.

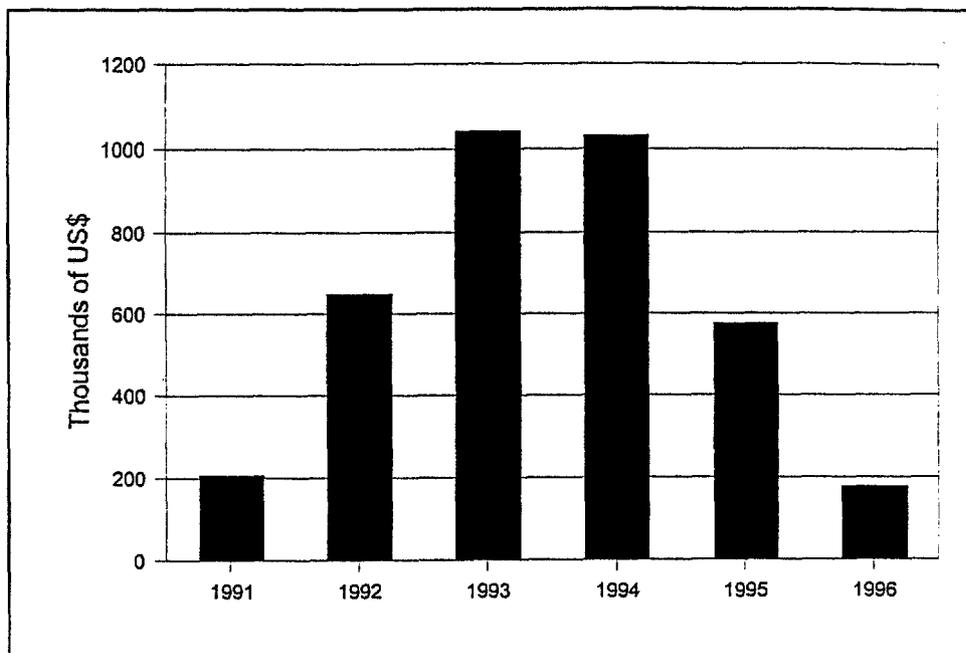
TABLE 33
TRAINING COSTS IN US\$ BY SITE

Year	Guinea	Guinea On-Site	Africa	Outside Africa	Total
1991	46,696	28,442	48,425	82,042	205,605
1992	228,020	101,181	6,752	312,476	648,429
1993	176,605	172,872	198,700	492,293	1,040,470
1994	76,648	91,688	162,496	701,333	1,032,165
1995	149,800	124,400	10,000	291,000	575,200
1996	126,864	8,100	18,305	23,694	176,963
Total	804,663	526,683	444,678	1,932,838	3,678,832
Percent	22%	14%	12%	52%	100%

Over a period of five years, a total budget of US\$3,678,832 was committed to training, for a total of 13,882 trainee-weeks. These costs only include the DNGR, since the UME, BIT and the AFVP were in charge of training private contractors.

As the data in Figure 24 show, 1993 and 1994 were the two years when training efforts, according to the allocated budget, were at their maximum, peaking at US\$1,040,470 for 1993. It is normal for the peak training period to occur well before the end of the project. The 1995 training plan was the result of cost-consciousness: Since there were fewer resources to allocate, the budget for that year totaled US\$575,200. The 1996 budget, of US\$176,963, was reduced to a minimum.

Figure 24
Training Costs
1991 – 1996



While training costs were higher in 1994, Table 34 shows that the volume of training that year, 2,395 trainee-weeks, is almost half of 1993's 4,080 trainee-weeks. This is because of the increased level of participant training in 1994, which costs almost five times as much as third-country training.

The largest budget line was allocated to participant training in Europe, the United States, and Canada. Overseas training accounted for over half the total training budget: 52 percent, compared with 12 percent for third-country training. This latter form of training involves mostly study trips.

Eighty percent of the training was held in Guinea, 5 percent in other African countries, and 6 percent outside of Africa.

TABLE 34
AMOUNT OF TRAINING IN TRAINEE-WEEKS BY SITE

Year	Guinea	Guinea On-Site	Africa	Outside Africa	Total
1991	298	51	121	33	503
1992	3,233	225	12	135	3,605
1993	3,190	370	322	197	4,079
1994	1,608	224	274	289	2,395
1995	1,981	302	18	127	2,428
1996	749	102	5	16	872
Total	11,059	1,274	752	797	13,872
Percent	80%	9%	5%	6%	100%

The number of trainings per year peaked in 1993, with more than 4,000 trainee-weeks. It stabilized between 1994 and 1995, with slightly more than 2,000 trainee-weeks.

Figure 25
Amount of Training by Trainee-Weeks
1991 – 1996

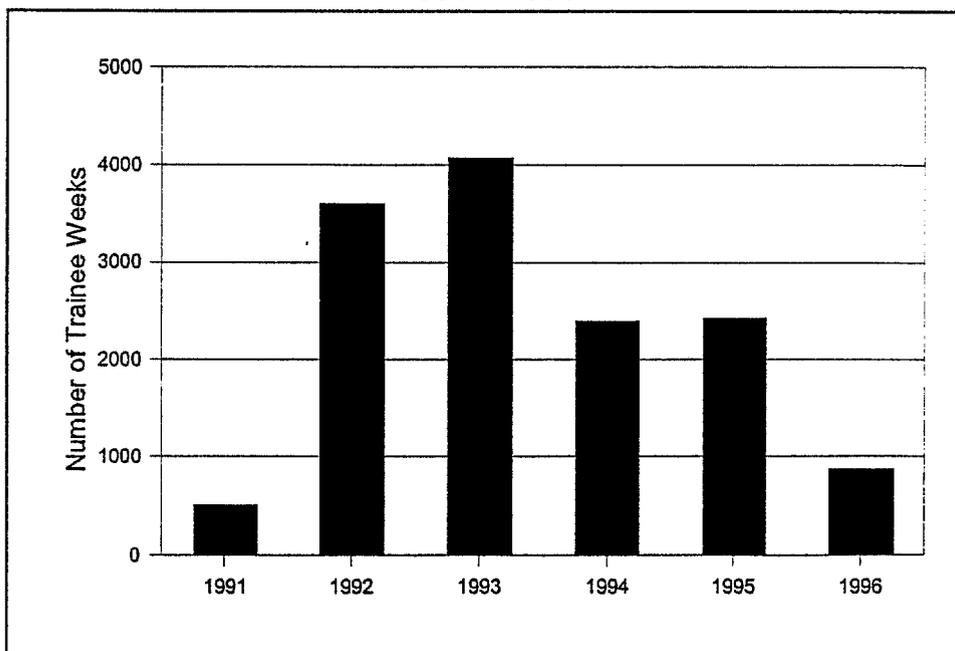


Figure 26 compares the relative costs of a trainee-week in Europe or the United States with one in Guinea, and shows that training outside Africa is 30 times more expensive than training in-country.

FIGURE 26
COST OF TRAINING BY SITE
(PER TRAINEE-WEEK)

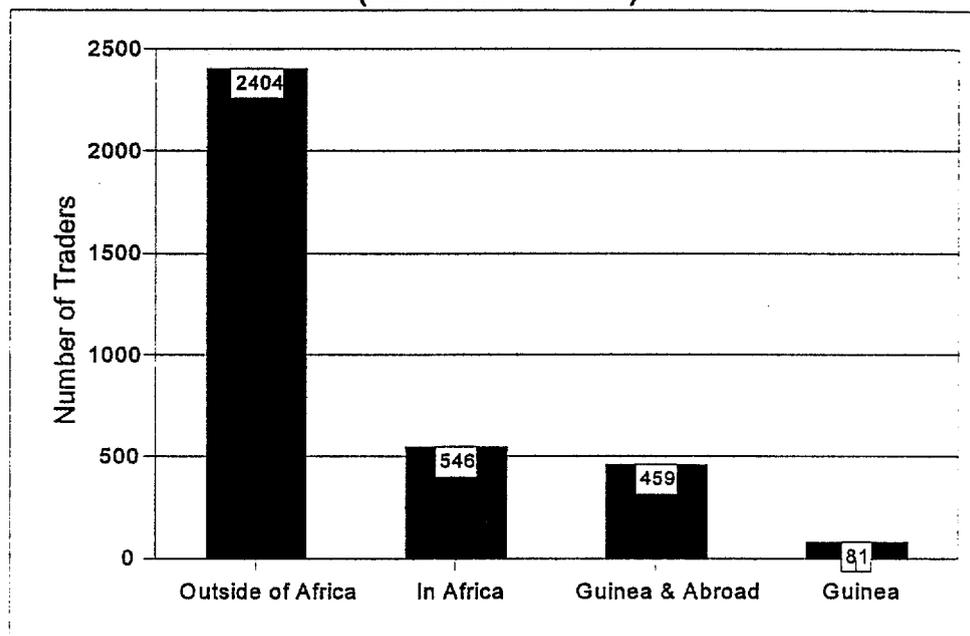
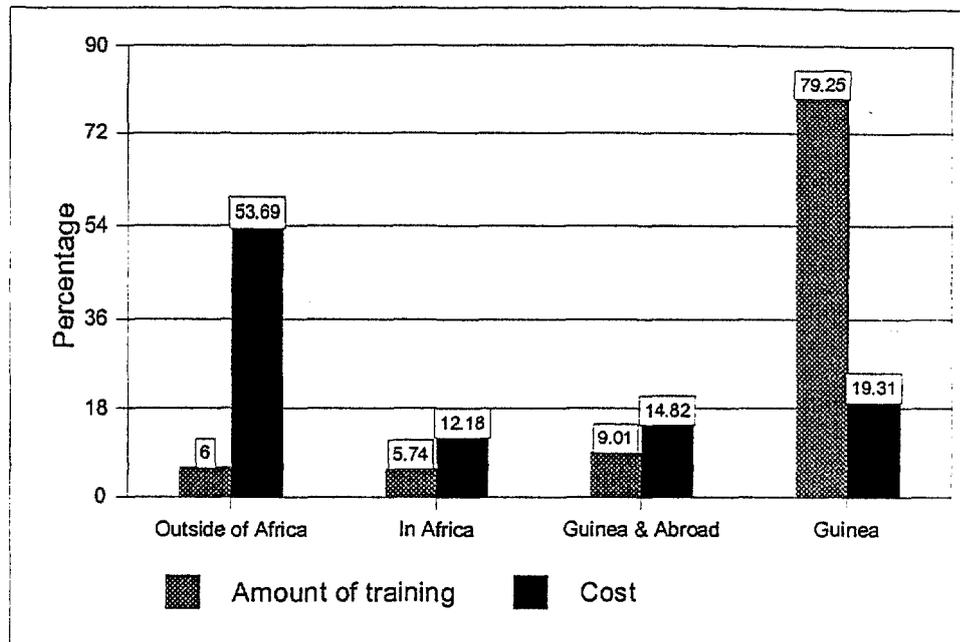


Figure 27 compares the costs per site of training and shows the disproportion between the amount of training per site, of which training in Guinea absorbed 79 percent, and the costs of training per site, of which training outside Africa absorbed 54 percent. In effect, US\$1.8 million were spent (representing 54 percent of the total cost of training) on 6 percent of the total amount of training.

**FIGURE 27
COMPARISON OF TRAINING SITES AND COSTS**



The total number of trainees reached 2,659 over a period of 6 years. In other words, each DNGR agent averaged three different trainings over that period. Considering the number of trainee-weeks to date (13,882), it is clear that training had a decisive impact on the PNIR project, and on the process of improving the roads in general. It is undeniable that training and enhanced skills have led to a rebuilt DNGR, one that is now operational and able to meet its objectives.

TABLE 35
NUMBER OF TRAINEES UNDER THE PNIR PROJECT
1991 – 1996

Year	Number of Trainees	Trainee-Weeks
1991	163	503
1992	419	3,605
1993	569	4,079
1994	542	2,395
1995	411	2,428
1996	555	872
Total	2,659	13,882

The training targets for the DNGR were:

- ◆ training the executive staff in management, organization, and leadership;
- ◆ designing the methodological tools necessary to meet the project's objectives;
- ◆ upgrading and updating basic rural engineering skills;
- ◆ increasing computer use and improving computer skills; and
- ◆ improving human resources development capacity.

Finally, since capacity-building for SMEs is an important objective of the PNIR project, a support unit was created inside the DNGR's training cell, which is now called the Human Resources Development Section.

6.4. SME CAPACITY BUILDING

The support granted SMEs through the UME and the training workshops provided for SME agents has already been described in the section concerning SMEs. More than 80 SMEs received training over the 3-year period, for a total of 119 trainees. Further support was provided by the HIMO-BIT project, which was designed to test an alternative to the Public Works by contracting out labor-intensive road rehabilitation and maintenance to SMEs and NGOs. The project provided training in labor-intensive methods to the SMEs and the NGOs. To date, more than 500 km of roads have been maintained using these methods, of which more than 200 km were maintained in 1995 alone.

TABLE 36
WORK CARRIED OUT WITH LABOR-INTENSIVE METHODS IN 1995

Lot	Section	NGO or SME	Length (km)
7	Bokodjon-Kour.	AVTR	15.0
8	Bokaria-Herico	ADRI-Guinee	14.2
9	Woula-Conta	ADDDG	23.0
10	Dotto-Kaffon	TELEPA	11.0
11	Kaffon-Tassin	ADECOMA	12.0
12	Moussaya-Laya	AGCDG	17.5
13	Popodara-Kuol.	AFD	16.0
14	Ditin-Poredaka	CROA	29.0
15	Hafia-Timbi M.	CBPT	19.2
17	Linsan Saran	UPK	22.0
18	Ourk.-Sitak.-Th.	UDF	21.5
TOTAL			200.4

Finally, we should mention the DAP, which was created by the DNGR in 1995. The DAP unit has three basic functions:

- ◆ on an external level, the DAP facilitates relations between the SMEs and the administration and suggests changes in rules and regulations concerning contracts and bidding. Its also sensitizes donors to the needs in the SME sector, especially in regard to equipment and training;
- ◆ on an internal level, the DAP supports the SMEs by providing them with technical as well as management training support. Significant progress has been achieved in this area. More than 130 SMEs are currently in contact with the DAP, and 80 have benefited from training and technical assistance; and
- ◆ on an operational level, the DAP depends on the UME, whose purpose is to ensure the technical training of private contractors; the Dubréka pilot project, which trains SMEs in the techniques of labor-intensive (HIMO) work; and private trainers for management and business management training.

The role of the DAP has been modest to date. Its organizational affiliation inside the DNGR has not provided it with sufficient credibility to become a true intermediary between the SMEs and their public partners. Nevertheless, this organization has proved that it is relevant, and it is now attempting to

consolidate its position. It will do this by broadening the services it extends both to the SMEs and to the public services that work in the same domain. On an operational level, the coordination of all the training providers (BIT, UME, AFVP) is well underway, and the DAP is currently attempting to harmonize the various objectives and strategies of SME training.

6.5. INFRASTRUCTURE

The various organizations that constitute the DNGR were formed in part due to a vast program of infrastructure renovation and construction, for a total of nearly US\$2.5 million.

As Table 37 shows, this program consisted of:

- ◆ the construction of new headquarters for the DNGR in Matoto;
- ◆ the construction of offices and living quarters for the BTGRs in Boke, Faranah, Mamou, and N'Zerekore, and for the UME of Mamou;
- ◆ the renovation of the BTGRs of Kankan and Kindia;
- ◆ the construction of offices for the SPGRs of Telimele, Pita, Gaoual, Koundara, Macenta, Kerouane, Beyla, Coyah, Dubreka, and Mamou; and
- ◆ the renovation of the SPGR offices in Dinguiraye.

TABLE 37
OFFICE CONSTRUCTION AND RENOVATION

Structure	Location	Surface in square meters	Cost in US\$1,000	Completion rate
DNGR headquarters	Matoto	1,680	693	100%
BTGRs	Boke & SPGR	420	258	100%
	Faranah & SPGR	510	187	100%
	Mamou & SPGR	540	317	100%
	N'Zerekore	420	246	100%
UME	Mamou		see Mamou	
SPGR	Beyla	160	21	50%
	Coyah	135	39	70%
	Dubreka	160	138	100%
	Gaoual	160	32	100%
	Kerouane	160	43	50%
	Koundara	160	32	70%
	Macenta	160	43	100%
	Pita	160	26	100%
	Telimele	152	35	100%
Subtotal for construction		4,977	2,110	90%
BTGR	Kankan	280	36	100%
	Kindia	172	36	100%
SPGR	Dinguiraye	140	32	0%
Subtotal for renovation		592	104	70%
Studies and supervision			135	90%
Total		11,180	2,349	85%

All of these infrastructural improvements allow the DNGR agents to enjoy decent working conditions. The conditions in the former offices made work difficult: The lack of space, the deterioration of the buildings, the lack of office furniture (some engineers had to share a desk with four or five others), as well as electrical outages were a constant constraint to activities. The investment in renovations was a remedy to these ills, and provided the DNGR's employees with a pleasant and conducive work environment. This is also true in the interior, at the SPGR and BTGR offices.

6.6. COMMODITIES AND EQUIPMENT

In the context of institutional capacity building, the DNGR has furnished itself with a vast array of equipment that corresponds to the amount of its activities. At the beginning of the PNIR project, the DNGR owned only 11 vehicles, 1 computer, and a photocopier. In 1995, the DNGR owned 96 vehicles, 18 generators, 30 computers, and 15 copiers. The engineers now have enough equipment to carry out their tasks. The present value of the total amount of equipment at the DNGR is more than US\$4.5 million.

TABLE 38
DNGR EQUIPMENT
1995

Type of equipment	Quantity	Cost in US\$
Rolling stock		
Vehicles	96	2,068,000
Motorcycles	151	336,000
Spare parts		110,000
Construction equipment	39	NA
Office furniture		200,000
Computer equipment, including:	49	
Computers	30	360,000
Topography equipment	251	280,000
Generators	18	170,000
Lab equipment		180,000
Radios	89	120,000
Technical workshop equipment (one complete workshop)	1	260,000
Technical office equipment	55	210,000
Photocopiers, etc.	41	70,000
Miscellaneous equipment (air conditioners, audiovisual, etc.)	307	150,000
Total		4,514,000

6.7. INSTITUTIONAL IMPACT

The preceding section showed how important the institutional strengthening component was to the DNGR. The impact of that support is measured by the DNGR's capacity to develop an effective road rehabilitation and bottomlands conversion program. The capacities acquired by the DNGR during the PNIR project can be measured at six different levels:

- ◆ the publication of general studies and terms of reference;
- ◆ the establishment of solicitation documents and the management of competitive bids;
- ◆ the signing of contracts for road lots;
- ◆ the supervision and tracking of work on the lots;
- ◆ the support provided to SMEs; and
- ◆ the establishment of an impact monitoring and evaluation system.

6.8. GENERAL STUDIES AND TERMS OF REFERENCE

From 1991 to November 1996, the DNGR carried out a number of important studies, including:

- ◆ a feasibility study for rural roads, in the context of a village water project in Mali prefecture, that was financed by KFW. This donor accepted the terms of reference in June 1994.
- ◆ a feasibility study for a strategy regarding mangroves and a pilot project in the plains of Soumbouya, Benty, and Mankouta in September 1994.
- ◆ the terms of reference for a feasibility study of a national program to halt hill erosion, financed by BADEA in October 1994.
- ◆ a study on hill erosion, in the context of the development of the agro-pastoral pilot program in the prefectures of Fria, Telimele, Boke, Gaoual, and Koundara, in June 1995.
- ◆ an economic feasibility study of the bridge over the Niandan at Gbagbe and the associated roads in Kankan prefecture. This study was financed by FED and published in April 1995.
- ◆ a medium-term rural infrastructure program:
 - the rehabilitation of rural roads in the prefectures of Siguiri, Dabola, Kissidougou, Beyla, Gueckedou, Kerouane, and Lola. A request for financing was made to OPEP.
 - a pilot program for small-scale irrigation for fruit and vegetable crops. A request for financing was made to JICA.
- ◆ a study of agricultural mechanization in Guinea in the context of FAO project TCP/GUI/442. Policy and strategy established by the DNGR and the FAO in 1995.
- ◆ a study of conventional motorization in Guinea, by the DNGR with GRET, in July 1993.

- ◆ a preliminary study for an irrigated rice project in Coastal Guinea, in December 1995, that was funded by the CFD.
- ◆ a preliminary study for the development of 1,200 hectares of bottomlands, financed by BADEA, in June 1996.
- ◆ a feasibility study for the development of irrigated rice in Coastal Guinea, financed by the CFD, in September 1996.
- ◆ a joint DNGR/CFD study for a development project in Coastal Guinea, in October 1996.
- ◆ a study on the development of the plains in Upper Guinea. The terms of reference for that study were accepted by the CFD in October 1996.
- ◆ the terms of reference for a feasibility study concerning the rural roads program for the prefectures of Koumbia, Tougue, Telimele, Kindia, and Boke, in March 1996.
- ◆ the terms of reference for a feasibility study for a rural bridges program, in April 1996.
- ◆ the terms of reference for an impact study of bottomlands development, in May 1996.
- ◆ the terms of reference for a feasibility study concerning a program to fight hill erosion in agro-pastoral areas in the prefectures of Fria, Telimele, Boke, and Koundara.

6.9. STUDIES UNDER PREPARATION

The following studies are currently being performed:

- ◆ the terms of reference for a feasibility study of plains development in Upper Guinea.
- ◆ a reclassification scheme of the rural roads matrix, financed by IDA in the context of the medium-term program.
- ◆ the terms of reference for the rehabilitation of the fruit docks in the port of Benty.
- ◆ the terms of reference for an irrigated rice development project in Coastal Guinea.

All of these studies and terms of reference were carried out or are being carried out under the direct responsibility of the DEP technical assistant.

6.10. SOLICITATION DOCUMENTS

Creating the necessary paperwork to solicit competitive bids on rural infrastructure improvements is a rather long and complex process. Each request for proposals has two parts:

- ◆ a purely administrative section that defines the rules and regulations pertaining to the competitive bidding process, presents a model proposal, and includes any general and particular administrative clauses;
- ◆ a technical section that defines all the technical specifications of the proposed work. This section includes a detailed manual describing the general state of the road network and outlining the work to be done, followed by technical specifications, a price list, estimates, and, finally, road profiles and sample blueprints of the work to be done.

As far as solicitations for large road lots are concerned, to date 31 requests for proposals have been issued by the DNGR, for a total road length of 3,022 km.

TABLE 39
NUMBER OF SOLICITATIONS PREPARED BY THE DNGR

Year	Number of solicitations	Road length in km
1991	1	183
1992	7	1,513
1993	7	555
1994	10	531
1995	6	240
1996	0	0
Total	31	3,022

6.11. CONTRACTS

Between the solicitation and the contract signing, several months can go by: the average delay was 7 months for the 18 contracts for large road lots signed to date. Sometimes road projects are even cancelled, and rescheduled, as was the case in Beyla. When the contractors' bids exceed the allocated budget, contract bidding is terminated and a new solicitation is prepared and issued.

The number of contracts signed between private firms and the DNGR exceeds 400; the larger contracts are shown in Table 40.

TABLE 40
LARGE CONTRACTS BETWEEN DNGR AND PRIVATE FIRMS
1991 – 1995

Lots	Km	Bids tendered	Firm	Contract signed	Amount in millions of GF
7b/CFD Gaoual-Koundara	183	10/25/91	CSE	2/21/92	2,872
7a/USAID Gaoual-Koundara	146	5/4/92	CSE	8/3/92	2,389
1/KFW Mamou	217	5/11/92	CBC	12/9/92	3,868
2/KFW Kissidougou	188	5/11/92	CBC	12/9/92	3,736
5/USAID Faranah	199	9/14/92	SMS-Coleman	12/21/92	4,173
6/USAID N'Zerekore	206	9/14/92	Astaldi	12/30/92	5,328
10/USAID Pita-Telimele	306	9/14/92	Astaldi	12/30/92	6,388
PCPEA Kindia	125	9/15/93	Adrane	4/22/94	1,574
ODRIK Kouroussa	251	9/20/93	SEK	2/7/94	4,117
National Budget Gaoual-BTGR Labe	33		BBCI	1/18/94	195
12/National Budget Kerouane	38	11/25/93	Guiter	3/29/94	887
13/National Budget Boffa	31	11/25/93	Cogei-Rossmo	3/29/94	480
9a/USAID Boke	35	11/29/93	BCE	2/23/94	754
9b/USAID Boke	42	11/29/93	Cogei-Rossmo	2/21/94	1.067
11/USAID Macenta	99	1/3/94	Picoli-Guiter	3/18/94	1,558

Lots	Km	Bids tendered	Firm	Contract signed	Amount in millions of GF
7c/CFD Gaoual-Koundara	55	6/13/94	Magassouba	11/8/94	1,558
16b/FED Dubreka	13	12/16/94	Batco Eng.	12/26/94	261
CFD Lola-Foumbadou	23	12/16/94	Sakho Trav.	1/19/95	461

As can be seen from Table 41, the number of small contracts signed with SMEs (173) is considerably larger than the number signed with big companies (18). This shows the commitment to and the results of supporting SMEs.

TABLE 41
NUMBER OF CONTRACTS SIGNED WITH SMEs

Year	Number of contracts	Amount in millions of GF
1991	6	105.702
1992	98	1,961.557
1993	9	248.926
1994	51	1,201.460
1995	9	240.948
1996	0	0
Total	173	3,758.490

6.12. SUPERVISING AND MONITORING WORK PERFORMANCE

The DNGR, after an international search, selected Louis Berger International Inc. to supervise construction and rehabilitation work on the rural roads. The contract was financed by the World Bank and signed in January 1992. A quarterly report allows work progress to be tracked. Several local supervisors have been trained and, progressively, they are replacing the contractors' technical advisors.

6.13. RURAL ROADS MASTER PLAN

The objective of the master plan is to establish a short-term and long-term program for improving rural roads. In the first phase, this involves inventorying existing roads by gathering a set of physical, social, and economic characteristics on each of them. These data are then entered into a database in order to prioritize roads according to the national interest and establish a work program in function of available resources.

The database constitutes the basis of the master plan. It is a permanent planning instrument for DNGR activities and allows the DNGR to design its rural development intervention policy. The supporting software is installed at the central level and in every BTGR. It is coupled with a Geographic Information System (GIS) that allows a set of results to be visualized and the corresponding maps to be drawn up.

6.14. SMALL AND MEDIUM ENTERPRISES

The PNIR project has greatly supported the emergence and development of SMEs in the areas of bridge building, road rebuilding, and building construction. More than 80 SMEs have attended trainings by the UME, and the DNGR has signed more than 170 contracts with SMEs for a total of US\$3.5 million.

6.15. RURAL ROADS MONITORING AND EVALUATION SYSTEM

Finally, USAID's financial assistance allowed a system of impact monitoring and evaluation to be established in the DNGR. This resulted in a reorganization of the Division of Studies and Planning and the creation of a monitoring and evaluation section inside this division. The impact surveys follow an established schedule and have been published in a series of eight volumes describing the data collected by each BTGR. The first overall impact assessment is provided by the present report.

6.16. CONCLUSION

The PNIR project provided considerable institutional support for the DNGR. This support has been characterized by a large amount of technical assistance: 759 man-months to November 1995. The training provided for the DNGR agents was also considerable, since it totaled 13,382 man-weeks, for a total cost of US\$3.5 million. While 52 percent of the budget was spent on short-term participant training, this only represents 6 percent of the total man-weeks of training. This same participant training budget would have allowed 40 agents to be trained for a year in the United States, allowing them to acquire undeniable professional skills. We can thus ask whether other training options shouldn't be considered, with the objective of balancing out the various types of training.

SME support was provided by a reactivated DAP inside the DNGR, whose purpose is to consolidate the SMEs by providing them with managerial and technical training. Finally, investments for the construction and renovation of offices totaled US\$2.3 million, and allowed the DNGR agents at both the central and the local levels to enjoy a pleasant and productive working environment. New equipment and commodities cost US\$4.5 million and included vehicles, furniture, computer equipment, and office supplies.

The impact of the institutional strengthening on the DNGR is measured by its capacity to develop an effective rural roads and hydro-agricultural improvement program. The DNGR has carried out dozens of general studies over the last 5 years. It issued 31 major requests for proposals for large road lots and signed 18 contracts with large firms, 173 community action contracts with SMEs, and more than 300 other contracts for road work or maintenance. To date, over 1,400 km of roads have been improved, out of the 2,500 scheduled. Taking the totality of the DNGR's program into account, which covers 5,600 km, almost 3,900 km are finished to date. All these numbers show the impact of institutional support to the DNGR.

The road from Pampore to Gouecke in June 1994



And in June 1996



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7. IMPACT ON THE ENVIRONMENT

The environmental impact indicators measure a certain number of potential problems, such as wild animal life and habitat, risks of erosion along the roads, stream levels, and the amount of human activity, insofar as the appearance and development of new villages could endanger fauna and flora, especially in the Forest Zone of Guinea.

Before the agreement to finance the rehabilitation of over 1,200 km of rural roads was signed, an environmental impact assessment was carried out on 39 road sections in order to determine what risks the roads entailed. Five principal areas were identified:

- ◆ the condition of tropical forest vegetation;
- ◆ the condition of wild animal life;
- ◆ risks of erosion;
- ◆ stream levels; and
- ◆ human population density.

The results of this study indicate that no serious negative impact in any of the above categories would result from the road improvement process. In fact:

- ◆ the project would not open any new roads, but would only improve the existing ones;
- ◆ none of the proposed roads traverse protected areas; and
- ◆ the roads in the Forest Zone are for the most part surrounded by secondary forests that are largely under cultivation by farmers.

The DNGR surveys of the selected villages confirm this. To date, the road improvements have not accelerated the transformation of forests into agricultural lands. Degradation of the forests, as in N'Zerekore or Lola prefectures, is more the result of an influx of refugees than of road improvements. The only negative derived impact is that it is now easier to transport large tree trunks along improved roads. Throughout the Forest Zone, trucks that are overloaded with lumber head towards the Ivory Coast, where the wood is exported to Europe or other regions of the world.

7.1. TROPICAL FOREST VEGETATION

This zone refers mainly to the prefectures of Lola, N'Zerekore, Macenta, and Kissidougou. Sites visits have allowed us to establish that the areas immediately bordering the roads are already heavily marked by slash and burn agriculture, in rotation with fallow periods. These areas are normally planted with rice for two or three years, then they are left fallow or planted with coffee, bananas, or cola trees.

In the prefectures of Faranah, Telimele, Pita, Gaoual, and Koundara, the primary forest disappeared long ago, when it was transformed into agricultural land. Two agricultural practices coexist in these areas: a relatively short fallow period, allowing only 5 to 8 years between cultivation periods, and a longer fallow period of up to 20 years, allowing a certain type of forest to regenerate, which supports a small charcoal

industry. But it would seem that supply has outstripped demand, judging from the burnt tree trunks that one sees just about everywhere in that area. Near Beindougou, local people complain that "felling certain trees that were familiar to us has changed our landscape." In Donghol-Touma, the local authorities have observed the transportation of timber from Ley-Miroto Pita.

Nevertheless, in Kissidougou, the prefectural authorities already fear an "...invasion of lumberjacks, because the trunks are easy to transport out of the forest." They are already taking measures to limit this destructive activity. In certain areas, like Ouendekere, local authorities have reforestation plans. The authorities in Gaoual claim that "...the local people have already begun reforesting public lands." In Poredaka, "...people have been able to reforest thanks to the road." In Kithiar, "...the forestry agents are showing local people how to reforest and protect the forest." Brush fires are an immediate danger for the environment, and huge areas are burned off every year.

7.2. WILD ANIMAL LIFE

Numerous wild animal species have been inventoried in all the areas traversed by the roads. But these animals are few in number because of agricultural activities along the roads. None of the roads traverse protected areas or reserves, so there is no immediate danger of species extinction. The animals most often cited by the local people include monkeys, wild boar, antelope, deer, pythons, rabbits, partridges, guinea-fowl, and agoutis. Few villages consider these animals to be threatened, since hunting is a regulated activity: In order to hunt, one needs a gun permit as well as a hunting license.

7.3. RISKS OF EROSION

All of the improved roads have ditches that are of sufficient depth to drain water even during periods of heavy rainfall. Drainage structures were built at crucial intervals to avoid the erosion of the roads as well as of surrounding land. On a few roads, certain structures proved to be insufficient at certain points, between Touba and Malanta, for example. Corrective measures are currently being implemented. On all improved roads, groundwater is channeled in a more effective manner, which diminishes the natural risks of erosion.

Any acceleration of erosion or soil loss due to intensifying agricultural activities in areas bordering the roads has not been noted yet, since it is still too early to notice any significant impacts. Agriculture will only develop over the long term, and we can surmise that local authorities will take the necessary steps to halt any type of rapid soil erosion.

7.4. WATER LEVELS

Numerous streams cross the improved roads. Before the roads were improved, water ran over the roads, causing much damage during the rainy season and halting traffic for several months. These drainage structures that did exist were in such a bad state that they often prevented water from draining off. Adequate drainage structures were constructed on all improved roads for each stream crossing or dam to allow steady

drainage and avoid any risk of eroding the road. Numerous drainage pipes, drains, and bridges were constructed, which have had a positive impact on the environment.

7.5. HUMAN POPULATION DENSITY

Prior to road improvements, we could expect a certain amount of human migration towards the roads, together with the establishment of villages along the roads. This would imply changes in the ecosystems of those areas, and village land tenure conflicts. It is still too early to note any significant changes in this regard, even though along the Kithiar road "...new villages are appearing ."

During a first stage, we may expect villages already along the road to revive, as is the case for Moribadou along the Macenta to Konsankoro road. But the direct negative effects of the road are minimal, because population changes are minimal. However, the influx of more than 500,000 refugees and the construction of refugee villages under the supervision of the HCR does threaten the natural resource base in those areas, as well as forests and fauna.

ANNEXES

1. Data on Villages Surveyed, 1994
2. Data on Villages Surveyed, 1995
3. Data on Villages Surveyed, 1996
4. Illustrations of Roads Before and After Rehabilitation

1. DATA ON VILLAGES SURVEYED, 1994

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Sites témoins

Villages		Traffic	Traffic	Nb personne	Nb	Distance	Temps	Vitesse Hor	Coût/tonne	coût	Nb	Nb	Nb Tickets	Nb mois	
Sélectionnés	BTGR	Hebdo	marché	marché	Transporteurs			Moyenne	marchandise	passager	Commerçants	Etalagistes	taxe	sans trafic	
1	Diguiry	Boké	5	5	130	5	53	3	17.7	50,000	3,000	18	35	120	4
2	Tarhoye	Boké	7	3	700	1	45	4	11.3	50,000	3,000	20	24	50	
3	Sourougamba	Faranah	0				20								12
4	Laya-Komboya	Faranah	0				8.5	1.5	5.7	20,000	500		2		6
5	Farawindou	Guékédou	4				14			15,000			1		3
6	Feindou	Guékédou	2	1	750	1	32	2.5	12.8	25,000	3,000	20	50	30	4
7	Dabadou	N'zérékora	0				15	1	15.0	20,000	1,000		3		10
8	Massaranabakoro	Kankan	0				45	3	15.0		5,000				6
9	Kanfrandou	Kankan	0	2		2	16	3	5.3	30,000	2,000				6
10	Kambara	Labé	4	4	1200	2	26	3	8.7	10,000	2,000	60	500	500	3
11	Sambalé	Labé	0				8					8	0		12
12	Touny	Labé	30	26	800	14	9	0.5	18.0	5,000	400	6	65	0	
13	Djinka	Labé	9				10								
14	Alphaya	Mamou	44			6	25	0.5	50.0	20,000	1,500				
15	Samba-barry	Mamou	10	6	1300	5	23	2	11.5	25,000	1,500	50	90	0	3
16	Kaffa	Mamou	14	8	3000	8	25	2	12.5	10,000	1,000	16	105	80	
17	Balimou	N'zérékora	54	50		5	9	0.5	18.0	10,000	500		3		2
18	Koule	N'zérékora	18	8	500	8	15	0.5	30.0	20,000	800	6	100	200	2
Nombre de sites étudiés			18	10	8	11	18	14		14	14	9	13	8	13
Moyenne			11	11	1048	5	22	2	11.5	22143	1809	23	74	123	6
STD			15.49	14.55	814.81	3.69	13.37	1.15		13190.13	1266.04	18.23	128.33	155.78	3.43
Max			54	50	3000	14	53	4		50000	5000	60	500	500	12
Min			0	1	130	1	8	0.5		5000	400	6	0	0	2

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Sites témoins

	Villages Sélectionnés	BTGR	Superficies emblavées										
				riz	Fonio	café	manioc	arachides	maïs	sergho/mil	coton	autres	
1	Diguity	Boké	67	40	5			9	13				
2	Tarihoie	Boké	195	65			10	80		40			
3	Sourougambe	Faranah	22	3	2					10			7
4	Laya Komboya	Faranah	50	30	5								15
5	Farawindou	Guékédou	47	20		22	5						
6	Faïndou	Guékédou	148	135				10		3			
7	Dabadou	N'zérékore	175	120			50			5			
8	Massarenabakoro	Kankan	360	360									
9	Kanfrandou	Kankan	430	220			180	30					
10	Kembera	Labé	420	250					100	70			
11	Sambalde	Labé	52					23					29
12	Touny	Labé	380	50			60	120		150			
13	Djinka	Labé	52	10	28			14					
14	Alphaya	Mamou	313	48	50		65						150
15	Samba-barry	Mamou	41	10	15		4	12					
16	Kaffa	Mamou	152.6	70	75					4			3.6
17	Balimou	N'zérékore	74	50		21		3					
18	Koule	N'zérékore	55	25		30							
Nombre de sites étudiés			18	17	7	3	8	10	5	2	0		5
Moyenne			169	89	26	24	48	41	46	25	ERR		41
STD			141.64	96.98	25.52	4.03	55.46	40.55	57.77	15.00	ERR		55.24
Max			430	360	75	30	180	120	150	40	ERR		150
Min			22	3	2	21	4	3	3	10	ERR		3.6

Enquêtes Novembre 1994

Sites témoins

	Villages Sélectionnés	BTGR	Volume total drainés/mois								Agrumes		
				riz	Fonio	café	manioc	banane	huile rouge	arachides	Fruits	autres	
1	Diguity	Boké	89	22	8		16			14	15		14
2	Tarihoie	Boké	13	10			1			1	1		
3	Sourougambe	Faranah											
4	Laya Komboya	Faranah											
5	Farawindou	Guékédou	9	2		1.5			5				0.5
6	Feindou	Guékédou	36	20					4		2	4	6
7	Dabadou	N'zérékore	5.1	2.2	0.7		1			0.8			0.4
8	Massarenabakoro	Kankan	2.3	1.3							0.6		0.4
9	Kanfrandou	Kankan	16.9	10	1		1.8				3	0.8	0.3
10	Kembera	Labe	32	12						6.4	4		9.6
11	Sambalde	Labe	19								11		8
12	Touny	Labe	28.4		4.8		8.4				3.2		12
13	Djinka	Labe	6.5						2.5			1.5	2.5
14	Alphaya	Mamou	0.95	0.45	0.1		0.1						0.3
15	Samba-barry	Mamou	16	2	2.8						2.4		8.8
16	Kaffa	Mamou	46.6	20							0.5		26.1
17	Balimou	N'zérékore	13.4	4		2	2.4			1			4
18	Koule	N'zérékore	20	4		5				4			7
Nombre de sites étudiés			16	13	6	3	7	3	6	10	3	15	
Moyenne			22	8	3	3	4	4	5	4	2	7	
STD			21.19	7.57	2.77	1.55	5.38	1.03	4.70	4.59	1.37	6.82	
Max			89	22	8	5	16	5	14	15	4	26.1	
Min			0.95	0.45	0.1	1.5	0.1	2.5	0.8	0.5	0.8	0.3	

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Sites témoins

	Villages		Cultures					Élevages				
	Sélectionnés	BTGR	fruitières	oranges	banane	manguiers	avocatier	autres	bovins	ovins	caprins	volaille
1	Diguity	Boké	4	0.5	3			0.5	1500	2900	3200	
2	Tarihoïe	Boké	16	6	2			8	172	28	89	
3	Sourougambe	Faranah							343	34	27	
4	Laya Komboya	Faranah							2447	528	360	
5	Farawindou	Guékédou	20		20					60		100
6	Faïndou	Guékédou	18	5	10			3	30	40	16	220
7	Dabadou	N'zérékore	2.75	1.5				1.25	520	260	130	2000
8	Massarenabakoro	Kankan	102	17	4	34	35	12	600	500	800	
9	Kanfrandou	Kankan	39	18	1	20			250	500	160	
10	Kembera	Labé	4.4	1.5	0.5			2.4	446	92	410	
11	Sambalde	Labé	5	2				3	616	199	253	
12	Touny	Labé	75	40	10			25	500	700	600	
13	Djinka	Labé	4.5	0.5	3	0.5	0.3	0.2	470	54	1270	2280
14	Alphaya	Mamou							1200	1450	500	2500
15	Samba-barry	Mamou	8	4	2	1	1		952	169	607	3025
16	Kaffa	Mamou	21	7	2			12	1957	308	661	
17	Ballmou	N'zérékore	16	2.5	1.5			12	5	91	89	250
18	Koule	N'zérékore	15	10	2			3		500	200	1000
Nombre de sites étudiés			15	14	13			12	16	18	17	8
Moyenne			23	8	5			7	751	467	551	1422
STD			27.58	10.36	5.32			7.01	675.11	681.36	735.75	1092.37
Max			102	40	20			25	2447	2900	3200	3025
Min			2.75	0.5	0.5			0.2	5	28	16	100

Enquêtes Novembre 1994

Sites témoins

Villages Sélectionnés	BTGR	Organisation de la Production				Centre santé	salles classe	Nb forages	Nb artisans	maisons toiles	maisons semi-dur	maisons en dur	Nombre d'élèves
		Nb de proje	Nb ONG	Groupemen	Intrants								
1	Diguiti	Boké							10	18	1		
2	Tarihoie	Boké				1	2	1	35	19	3		
3	Sourougambo	Faranah						1	4				
4	Laya Komboya	Faranah					2	1	16	9			
5	Farawindou	Guékédou							2	40	1		
6	Feindou	Guékédou					4		8	35			
7	Dabadou	N'zérékore					1		5	5			
8	Messarenabakoro	Kankan							17	4			
9	Kanfrandou	Kankan							2	8			
10	Kembera	Labé					2	2	15	10			
11	Sambalde	Labé					3		19	5			
12	Touny	Labé					3	2	25	12			
13	Djinka	Labé					4		60	60			
14	Alphaya	Mamou					2	2	52	54			
15	Samba-barry	Mamou				1	3		45	38			
16	Kaffa	Mamou				1	2	1	20	20			
17	Balimou	N'zérékore				1	3	1	15	232			
18	Koule	N'zérékore				1	4		8	60			
Nombre de sites étudiés						6	13	8	18	17	3	0	
Moyenne						28%	72%	44%	20	37	2		
STD									16.82	52.29	0.94		
Max									60	232	3		
Min									2	4	1		

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Enquêtes Novembre 1994

Sites programmés, en cours de réhabilitation

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Villages Sélectionnés	BTGR	Trafic Hebdo	Trafic marché	Nb personne marché	Nb Transporteurs	Distance	Temps	Vitesse Horz Moyenne	Coût/tonne marchandise	coût passager	Nb Commerçants	Nb Étalagistes	Nb Tickets taxe	Nb mois sans trafic	
1	Colah	Boké	79	21	3,000	20	32	2	16.0	20,000	2,000	40	200	120	0
2	Kitar	Boké	0		200	0	84	6	14.0	50,000	8,000	6	30	20	0
3	Malenta	Boké	1	1	800	2	106	48	2.2	60,000	10,000	20		200	0
4	Termeasse	Boké	20	5	220	2	75	6	12.5	35,000	4,000	10	18	55	4
5	Koba	Kindia	4	3	1,000	3	73	6	12.2	50,000	4,000	8	13	30	0
6	Missira	Kindia	14	8	2,000	7	93	8	11.6	80,000	8,000	50	100	250	0
7	Tourkoun	Kindia	5	5	3,000	2	22	6	3.7	20,000	1,000	40	38	60	0
8	Beindougou	Faranah	1	1	20	1	28	3	9.3	25,000	2,000	1	0	0	6
9	Sangoya	Faranah	32	3	1,000	3	45	2	22.5	30,000	2,000		100		0
10	Kobikoro	Faranah	9	1	120	1	69	6	11.5	35,000	5,000	5	4	0	1
11	Gberedou-Baranant	Kankan	12	5	2,000	4	30	2	15.0	20,000	2,000	30	420	0	0
12	Monbadou	Kankan	0				37					0	0	0	12
13	Beindou	Guékédou	18				20	1.5	13.3	25,000	3,000		5		0
14	Ouendekere	Guékédou	11	11	1,500	11	42	3	14.0	30,000	3,000	50	40	37	0
15	Vasseridou	Guékédou	3	3	300	3	40	48	0.8	40,000	4,000	12	15		1
16	Hartou	Mamou	1	1		0	62	4	15.5	20,000	1,000	0	0	0	0
17	Poredaka	Mamou	2	2	200	2	56	4	14.0	10,000	3,000	10			0
18	Bonghof-touma	Mamou	7	1	800	1	60	8	7.5	30,000	4,000	20	30	52	0
19	N'zon	N'zérékora	0				17						3		12
20	Womey	N'zérékora	27	20	300	10	9	0.25	36.0	10,000	500	100	150		2
21	Koro	N'zérékora	10	10		10	19	0.75	25.3	35,000	800		6		3
22	Kakota	N'zérékora	11	11	830	11	15	1	15.0	30,000	1,000	9	29		2
Nombre de sites étudiés			22	18	17	19	22	20		20	20	18	20	14	22
Moyenne			12	6	1,017	6	47	8	5.7	32,750	3,415	23	60	59	2
STD			17	6	938	5	27	13		16,544	2,556	25	98	76	4
Max			79	21	3000	20	106	48		80,000	10000	100	420	250	12
Min			0	1	20	0	9	0.25		10,000	500	0	0	0	0

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Sites programmés, en cours de rehabilitation

	Villages		Superficies emblavées									
	Sélectionnés	BTGR		riz	Fonjo	café	manioc	arachides	maïs	sorgho/mil	coton	autres
1	Coliah	Boké	160	40				100				20
2	Kiliar	Boké	320	150				90	60			20
3	Malenta	Boké	397	178	69		65		50	15		20
4	Termesse	Boké	152				16	46	60	30		
5	Koba	Kindia	65	40				15	10			0
6	Missira	Kindia	270	200				70				0
7	Tourkoun	Kindia	153	50	15		10	70	4	4		
8	Beindougou	Faranah	80	70			10					
9	Sangoya	Faranah	98	75	5		4	4	10			
10	Kobikoro	Faranah	122	30	40	2		20	30			
11	Gberedou-Baranan	Kankan	590	150	200		160	80				
12	Moribadou	Kankan	226	137			45	3	25			16
13	Beindou	Guékédou	280	150		80	20	30				
14	Ouendekere	Guékédou	103	43		35		22	3			
15	Vasseridou	Guékédou	50	30			10	10				
16	Herico	Mamou	400	150	200		50					
17	Poredaka	Mamou	52	15	25			10				2
18	Donghol-tourna	Mamou	625	350	140		45	90				
19	N'zon	N'zérékore	110	100		5	5					
20	Womey	N'zérékore	35	10		25						
21	Koro	N'zérékore	23	23								
22	Kokota	N'zérékore	185	100			50	20	15			
Nombre de sites étudiés			22	21	8	5	14	16	9	3		7
Moyenne			204	100	67	29	36	43	26	16		11
STD			167	80	76	28	39	33	22	11		9
Max			625	350	200	80	160	100	60	30		20
Min			23	10	5	2	4	3	3	4		0

Sites programmés, en cours de rehabilitation

	Villages Sélectionnés	BTGR	Volume total drainés/mois								Agrumes		
				riz	Fonio	café	manioc	banane	huile rouge	arachides	Fruits	autres	
1	Coliah	Boké	28	12	2					2	8		4
2	Kiliar	Boké	3.1	2.1							1		
3	Maienta	Boké	3.42	1.5	0.86						1.06		
4	Termesse	Boké	5.95		0.75		1.2				4		
5	Koba	Kindia	14	8			2				2		2
6	Missira	Kindia	61.4	50	0.2					1.2	0.5		9.5
7	Tourkoun	Kindia	28.5	20				0.5			8		
8	Beindougou	Faranah	0.15	0.15									
9	Sangoya	Faranah	5.5	2.4	0.6		2				0.5		
10	Kabikoro	Faranah	4.4	2	1	0.9					0.5		
11	Gberedou-Baranar	Kankan	16.6	6	5		3.6	2					
12	Moribadou	Kankan	0										
13	Beindou	Guékédou	17.8	5.8			6	1.5			1	3.5	
14	Ouendekere	Guékédou	86	4		14		8	16		42	2	
15	Vassendou	Guékédou	12.3	1		10	0.3				1		
16	Herico	Mamou	0										
17	Poredaka	Mamou	7.6	3	2.5						0.8	1.3	
18	Donghol-touma	Mamou	4.4	0.7	1	0.2		1.5			1		
19	N'zon	N'zérékore	3.2	2		1.2							
20	Womey	N'zérékore	18			6		12					
21	Koro	N'zérékore	3	0.6		2			0.4				
22	Kokota	N'zérékore	10.4	2.4				2	4		2		
Nombre de sites étudiés			22	18	9	7	6	7	5	15	3	3	
Moyenne			15	7	2	5	3	4	5	5	2	5	
STD			21	12	1	5	2	4	6	10	1	3	
Max			86	50	5	14	6	12	16	42	3.5	9.5	
Min			0	0.15	0.2	0.2	0.3	0.5	0.4	0.5	1.3	2	

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Enquêtes Novembre 1994

Sites programmés, en cours de rehabilitation

	Villages		Cultures					Elevage				
	Sélectionnés	BTGR	fruitières	oranges	banane	manguiers	avocallier	autres	bovins	ovins	caprins	volaille
1	Coliah	Boké							173	218	481	
2	Kiliar	Boké	15	5				10	5926	1862	1417	20000
3	Malenta	Boké	39	9	12			18	6043	1004	1553	
4	Termesse	Boké	4	1.5				2.5	1223	167	227	
5	Koba	Kindia	12.7	6				6.7				
6	Missira	Kindia	52	15	10			27	105	124	118	
7	Tourkoun	Kindia	9	8	1				719	66	75	
8	Beindougou	Faranah	25	2	3			20	4600	1340	1130	
9	Sangoya	Faranah	61	30	5		25	1	1217	527	447	
10	Kobikoro	Faranah	17	10				7	5240	1514	988	
11	Gberedou-Baranar	Kankan	33.3	1			32	0.3	348	182	83	
12	Monbadou	Kankan	34.2		5		10	19	224	98	55	
13	Beindou	Guékédou	35	5	30				35	60	30	407
14	Ouendekere	Guékédou							26	82	84	430
15	Vassendou	Guékédou	10		10				2840	609	267	100
16	Herico	Mamou	29	3	5		6	3	1500	200	150	300
17	Poredaka	Mamou	29	15				14	6251	3377	3768	7950
18	Donghol-touma	Mamou										
19	N'zon	N'zérékore	1	1					0	105	95	350
20	Womey	N'zérékore	19	5	10			4	0	200	500	300
21	Koro	N'zérékore	10		10				30	160	30	200
22	Kokota	N'zérékore										
Nombre de sites étudiés			18	15	11			13	19	19	19	9
Moyenne			24	8	9			9	1921	626	605	3337
STD			16	7	7			8	2331	841	882	6357
Max			61	30	30			27	6251	3377	3768	20000
Min			1	1	1			0.2	0	60	30	100

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Enquêtes Novembre 1994

Sites programmés, en cours de rehabilitation

Villages Sélectionnés	BTGR	Organisation de la Production				Centre santé saïlas classe	Nb forages	Nb artisans	maisons toiles	maisons semi-dur	maisons en dur	Nombre d'élèves
		Nb de proje	Nb ONG	Groupemen	Intrants							
1	Collah	Boké				1	7	5	27	100	0	2
2	Kitlar	Boké					3	3	10		0	0
3	Malenta	Boké									0	0
4	Termesee	Boké				1	4		19	22	0	4
5	Koba	Kindia				1	3	2	11	19	0	2
6	Misira	Kindia				1	4	3	34	44	0	16
7	Tourkoun	Kindia					2	2	40	24	0	4
8	Beindougou	Faranah					6	3	7	9	0	4
9	Sangoya	Faranah					4	4	11	35	2	0
10	Kobikoro	Faranah					6		20	45	0	0
11	Gberedou-Baranan	Kankan										
12	Moribadou	Kankan				0			2	6	0	0
13	Beindou	Guékédou					11	2	10	45	2	1
14	Ouendekere	Guékédou				1	6	2	61	13	0	0
15	Vasseridou	Guékédou				1			5	16	0	0
16	Herico	Mamou					3		25	0	0	0
17	Poredaka	Mamou							0	0	0	0
18	Denghol-touma	Mamou				1	32	17	156	376	0	28
19	N'zon	N'zérékore					3		10	43	0	0
20	Womey	N'zérékore				1	6	1	20	100	0	5
21	Koro	N'zérékore					2		5	30	0	3
22	Kokota	N'zérékore				1		2	28		0	7
Nombre de sites étudiés						10	16	12	20	18	21	21
Moyenne						29%	46%	34%	25	62	0	4
STD									33	84	1	7
Max									156	376	2	28
Min									0	0	0	0

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2. DATA ON VILLAGES SURVEYED, 1995

Enquêtes Novembre 95

Sites témoins

Villages		Trafic	Trafic	Nb personne	Nb	Distance	Temps	Vitesse	Hor	Coût/tonne	coût	Nb	Nb	Nb Tickets	Nb mois
Sélectionnés	BTGR	Habdo	marché	marché	Transporteurs			Moyenne	marchandise	passager	commerçant	Etalagistes	taxe	sans trafic	
1	Diguity	8	6	180	6	53	3	17.7	50,000	3,000	12	24	100	4	
2	Tanhoye	2	2	700	2	45	4	11.3	60,000	3,000	24	50	62	0	
3	Sourougambe					20									
4	Laya-Komboya	2	0			8.5	1.5	5.7	30,000	2,000	0	0		6	
5	Faravindou	12				14				1,000					
6	Feindou	2	2	850	2	32	2	16.0	25,000	1,500	15	45	30	4	
7	Dabadou	0				15	1	15.0	20000	1000		4	0	10	
8	Massarenabak	1	1	417	1	45	3.5	12.9	25,000	3,500	1	12	0	7	
9	Kanfrandou	0	0	280	0	16							0	6	
10	Kembara	6	6	1,650	6	26	3	8.7	12,500	2,000	50	300	350	4	
11	Sambalde	0				8								12	
12	Touny	30	5	800	3	9	0.5	18.0	8,000	400	6	60		0	
13	Olinka	8				10									
14	Alphaya	51	18	180	6	25	0.5	50.0	20,000	1,500				0	
15	Samba-barry	15	6	1300	5	23	2	11.5	25000	2000	30	120	0	2	
16	Kaffa	14	6	3000	6	25	2	12.5	10000	1500	50	150	100	0	
17	Balimou	54	50		5	9	0.5	18.0	10000	500		4		0	
18	Koule	18	8	350	8	15	0.5	30.0	20000	800	15	70	6	2	
Nombre de sites étudiés		17	13	11	12	18	13		13	14	10	12	10	15	
Moyenne		13	8	882	4	22	2	12.0	24269	1693	20	70	65	4	
STD		16	13	806	2	13	1		14776	923	17	83	103	4	
Max		54	50	3000	8	53	4		60000	3500	50	300	350	12	
Min		0	0	180	0	8	0.5		8000	400	0	0	0	0	

Enquêtes Novembre 95

	Villages		Superficies emblavées									
	Sélectionnés	BTGR		riz	Fonio	café	manioc	arachides	maïs	sorgho/mil	coton	autres
1	Diguity	Boke	80	26	12		10	30	2			
2	Tarihoie	Kindia	234	80	2		12	85	15	40		
3	Sourougambe	Faranah										
4	Laya Komboya	Faranah	30	15	3				12			
5	Farawindou	Faranah										
6	Feindou	Guékédou	143.3	82	0.3	50	2	5	4			
7	Dabadou	Kankan	211	150	8		35	5	10			3
8	Massarenabak	Kankan	419	317	11		45	23	21	2		
9	Kanfrandou	Kankan	179	94	26		47	12				
10	Kembara	Labé	400	250	20		10	80	20	20		
11	Sambaide	Labé	205	24	18		2	38	36	45	42	
12	Touny	Labé	285	30	80		70	75	30			
13	Djinka	Labé	97	10	28		20	14	25			
14	Alphaya	Mamou	345	65	48	0.5	70	7.5	4			150
15	Samba-bary	Mamou	48	13	15		5	10	5			
16	Kaffa	Mamou	215	85	55		25	15	30			5
17	Balimou	N'zérékore	85	60		22		3				
18	Koule	N'zérékore	104.3	50		40	10	2	2			0.3
	Nombre de sites étudiés		16	16	14	4	14	15	14	4	1	4
	Moyenne		193	84	23	28	26	27	15	27	42	40
	STD		117	84	22	19	23	28	11	17	0	64
	Max		419	317	80	50	70	85	36	45	42	150
	Min		30	10	0.3	0.5	2	2	2	2	42	0.3

Enquêtes Novembre 95

Villages Sélectionnés	BTGR	Volume total drainés/mois	cultures vivrières							Agrumes	
			riz	Fonio	café	manioc	banane	hulle rouge	arachides	Fruits	autres
1	Diguity Boké	84.2	18	3		40	1.5	6	15	0.5	0.2
2	Tarihoie Kindia	71.5	30				0.2		40		1.3
3	Sourougambe Faranah										
4	Laya Komboie Faranah										
5	Farawindou Faranah										
6	Feindou Guékédou	42.1	10			2	16	0.4	0.9	10	2.8
7	Dabadou Kankan	3.55	1.5	1	0.4			0.1	0.35		0.2
8	Massarenabak Kankan	24.25	10	3		5	2.5		3	0.75	
9	Kanfrandou Kankan	2.8	1	0.9		0.4			0.5		
10	Kembera Labé	33	12	6			4		8		3
11	Sambalde Labé	6	1.5	0.4					1.3		2.8
12	Touny Labé	27.5	3.5	3		4	3		10		4
13	Djinka Labé	4.6	0.8	1		0.9	0.4		0.7		0.8
14	Alphaya Mamou	21.1	13			1	1.5		2.8	2.5	0.3
15	Samba-barry Mamou	10	3	2.5		1.5	1		2		
16	Kaffa Mamou	13.2	0.6	1			1.6		2	4	4
17	Balimou N'zérékore	11.4	1.2		6	0.4	1	0.8		2	
18	Koule N'zérékore	12.2	3		1	0.5	5	0.2	0.5	2	
Nombre de sites étudiés		15	15	10	3	10	12	5	14	7	10
Moyenne		24	7	2	2	6	3	2	6	3	2
STD		24	8	2	3	12	4	2	10	3	1
Max		84.2	30	6	6	40	16	6	40	10	4
Min		2.8	0.6	0.4	0.4	0.4	0.2	0.1	0.35	0.5	0.2

Enquêtes Novembre 95

	Villages		Cultures						Élevages			
	Sélectionnés	BTGR	fruitières	oranges	banane	manguiers	avocattier	Kolattier	bovins	ovins	caprins	volaille
1	Diguity	Boké	4	0.5	2	1	0.5		1500	2900	3220	
2	Tarihoie	Kindia	50.5	15	20	4.5	10	1	172	28	89	
3	Sourougambe	Faranah							2247	528	360	
4	Laya Komboya	Faranah										
5	Farawindou	Faranah										
6	Feindou	Guékédou	18	8	1	1	3	5	40	55	25	
7	Dabadou	Kankan	4.7	2		1.5	1.2		520	260	130	
8	Massarenabak	Kankan	102	17	4	34	35	12	270	632	490	
9	Kanfrandou	Kankan	39	18	1	20			263	185	462	
10	Kembera	Labé	4.4	1.5	0.5	2	0.4		446	92	410	
11	Sambaide	Labé	6	2		4			616	199	253	
12	Touny	Labé	74	40	10	15		9	550	800	700	
13	Djinka	Labé	4.5	0.5	3	0.5	0.3	0.2	479	70	1325	
14	Alphaya	Mamou	36.8	12	2	14	8	0.8	1450	1725	670	
15	Samba-barry	Mamou	8	4	2	1	1		1165	263	738	
16	Kaffa	Mamou	21	7	2	8	4		1957	308	673	
17	Balimou	N'zérékore	20	2.5	1.5	6	5	5	4	96	127	
18	Koule	N'zérékore	15.5	10	2	1	2.5		0	100	150	
Nombre de sites étudiés			15	15	13	15	12	7	16	16	16	0
Moyenne			27	9	4	8	6	5	730	515	614	
STD			28	10	5	9	9	4	690	742	746	
Max			102	40	20	34	35	12	2247	2900	3220	
Min			4	0.5	0.5	0.5	0.3	0.2	0	28	25	

Enquêtes Novembre 95

Villages Sélectionnés	BTGR	Organisation de la Production				Centre santé		Nb forages	Nb artisans	maisons toiles	maisons semi-dur	maisons dur	Nombre d'élèves	
		Nb Projets	NB ONG	Nb Gouprp	Infrants	salles	classe							
1	Diguiti	Boké	0						8	19	1			
2	Yanhoye	Kindia				1	2	1	35	20	1		86	
3	Sourougambe	Faranah												
4	Laya Komboya	Faranah	1				2	1	16	9			58	
5	Farawindou	Faranah												
6	Feindou	Guékédou			3		4		8	38	1	0	135	
7	Dabadou	Kankan	1		13		1		5	5	0	2	45	
8	Massarehabak	Kankan							5	4				
9	Kanfrandou	Kankan							8	7				
10	Kembera	Labé			2	1	2	2	15	12			88	
11	Sambalde	Labé	1		3	1	5	4	19	8	2	1	221	
12	Touny	Labé	2	0	2		3	2	30	100	5	0	135	
13	Djinka	Labé			3	1	4		64	64	62	2	135	
14	Alphaya	Mamou	2				2	2	52	56	2	0	72	
15	Samba-barry	Mamou			1		1	3	45	50	0	0	122	
16	Kaffa	Mamou	1	2	1	1	1	3	30	74	12	5	130	
17	Balimou	N'zérékore			3		1	3	15	236		5	83	
18	Koule	N'zérékore	3		1	1	1	6	13	200	0	0	305	
Nombre de sites étudiés			8	2	10	5	5	13	8	16	16	11	10	13
Moyenne			44%	11%	56%	28%	28%	72%	44%	23	56	8	2	124
STD										17	67	17	2	68
Max										64	236	62	5	305
Min										5	4	0	0	45

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Enquêtes Novembre 1995

Villages réhabilités ou en cours de réhabilitation en Novembre 95

Villages Sélectionnés	BTGR	Trafic	Trafic	Nb personne	Nb	Distance	Temps	Vitesse	Hor	Coût/tonne	coût	Nb	Nb	Nb Tickets	Nb mois
		Hebdo	marché	marché	Transporteurs										
1	Collah	Boke	72	24	3,500	24	32	1.5	21.3	10,000	2,000	16	49	100	0
2	Kitar	Boke	42	7	600	3	84	2	42.0	20,000	2,500		30	50	0
3	Malenta	Boke	15	14	1,150	4	106	5	21.2	45,000	5,000	3	47	120	0
4	Tarmessa	Boke	28	8	1,430	6	75	2	37.5	20,000	2,000		121	121	0
5	Koba	Kindia	3	3	1,000	3	73	5	14.6	60,000	4,000	30	50	30	0
6	Missira	Kindia	6	6	2,000		93	8	11.6	80,000	8,000	20	50	50	2
7	Tourkoun	Kindia	2	2	2,500	2	22	6	3.7	20,000	1,000	20	34	40	0
8	Beindougou	Faranah	71	3	800	3	28	1	28.0	10,000	1,000		1		0
9	Sangoya	Faranah	39	5	3,000	5	45	1.5	30.0	15,000	1,500	15	45		0
10	Kobikoro	Faranah	4	2	200	2	69	4	17.3	30,000	3,000		8		1
11	Gberedou-Bar	Kankan	11	4	1,000	2	30	2	15.0	20,000	2,000	20	250	0	0
12	Monbadou		1				37	4				0	0		12
13	Beindou	Guékédou	60			10	20	0.5	40.0	10,000	1,000		2		0
14	Quendekere	Guékédou	53	18	2,500	18	42	1.5	28.0	10,000	1,500	75	250	85	0
15	Vassendou	Guékédou	21	7							2,000				
16	Henco	Labé	21	17	316	13	62	1.5	41.3	15,000	1,000				0
17	Poredaka	Labé	202	91	7,080	32	56	2.5	22.4	8,500	3,000	33	57	217	0
18	Donghol Touma		178	74	1,800	29	60	0.75	80.0	8,000	2,500	104	137	223	0
19	N'zon		0	0			17								12
20	Womey	N'zérékoré	250	220	900	43	9	0.6	15.0	5,000	300	100	120		0
21	Koro		46	32		8	19	0.5	38.0	17,500	600	3	3		0
22	Kokota		15	15	310	8	12	1	12.0	25,000	1,500	7	35		2
Nombre de sites étudiés			22	20	17	18	21	20		19	20	14	19	11	21
Moyenne			52	28	1770	12	47	3	18.6	22679	2270	32	68	94	1
STD			68	50	1632	12	28	2		18892	1727	34	74	69	3
Max			250	220	7080	43	106	8		80000	8000	104	250	223	12
Min			0	0	200	2	9	0.5		5000	300	0	0	0	0

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Enquêtes Novembre 1995

Villages réhabilités ou en cours de réhabilitation en Novembre 95

	Villages		Superficies emblavées											
	Sélectionnés	BTGR		riz	Fonio	café	manioc	arachides	maïs	sorgho/mil	coton	autres		
1	Coliah	Boke	240	100	60			80						
2	Kittar	Boke	434.5	150	120		5	100	10	20	29.5			
3	Malenta	Boke	679	217	80		90	165	120	7				
4	Termesse	Boke	284	44	26		12	88	72	41			1	
5	Koba	Kindia	168	60	2		6	70	10	20				
6	Missira	Kindia	240	150				80	5	5				
7	Tourkoun	Kindia	153	50	15		10	70	4	4				
8	Beindougou	Faranah	111	90			15	6						
9	Sangoya	Faranah	99.8	90	5		1.5	2	0.4	0.6			0.3	
10	Kobikoro	Faranah	175	50	35	20	25	45						
11	Gberedou-Bar	Kankan	272	120	42		70	40						
12	Monbadou		167.5	120	4	18	25	0.5						
13	Beindou	Guékédou	160	60		80	10	10						
14	Ouendekere	Guékédou	279	50	1	35	45	144	4					
15	Vasseridou	Guékédou	0											
16	Henco	Labé	539	152	105		40	64	53				125	
17	Poredaka	Labé	89.05	15.5	27	7	4	23	9	0.8	0.25		2.5	
18	Donghol Touma		923	600	158		9	52	87	17				
19	N'zon		104	70		30		4						
20	Womey	N'zérékoré	82	30		50	2							
21	Koro		0											
22	Kokota		138	130		8								
Nombre de sites étudiés			22	20	14	9	16	18	11	8	2		4	
Moyenne			243	117	49	29	26	60	28	12	15		32	
STD			218	121	48	23	26	47	36	13	15		54	
Max			923	600	158	80	90	165	120	41	29.5		125	
Min			0	15.5	1	7	1.5	0.5	0.4	0.6	0.25		0.3	

Enquêtes Novembre 1995

Villages réhabilités ou en cours de réhabilitation en Novembre 95

Villages	Sélectionnés	BTGR	Volume total drainés/mois	cultures vivrières						Agrumes		
				nz	Fonio	café	manioc	banane	huile rouge	arachides	Fruits	autres
1	Coliah	Boke	19.4	4	0.2				3.2	12		
2	Kittar	Boke	9.6	2.4	1.6					4.8		0.8
3	Malenta	Boke	14.5	3.2	4			2.5		4.8		
4	Termesse	Boke	24.8	9.2	3.2		4.8	0.8		2		4.8
5	Koba	Kindia	0									
6	Missira	Kindia	19.7	16				0.5		3.2		
7	Tourkoun	Kindia	28	20						8		
8	Beindougou	Faranah	54	44				2			8	
9	Sangoya	Faranah	9.26	4	2.8		1.6		0.24	0.32		0.3
10	Kobikoro	Faranah	19.4		8		5			6.4		
11	Gberedou-Bar	Kankan	8.8	4.8	4							
12	Moribadou		0									
13	Beindou	Guékédou	0									
14	Ouendekere	Guékédou	39	12	0.2		2	8	0.4	0.4	4	12
15	Vasseridou	Guékédou	0									
16	Herico	Labé	45.2	8	6.7		2			17	5.5	6
17	Poredaka	Labé	53.5	16	12	0.5	1	2		12	8	2
18	Donghol Touma		63.7	40	2	1.2	2.5	10		8		
19	N'zon		15.2	2		8		1.2	0.6	0.4		3
20	Womey	N'zérékoré	29	8		6	4	0.2	8	0.8	2	
21	Koro		0									
22	Kokota		74.5	40		2.3	3.2	2	24	3		
Nombre de sites étudiés			22	16	11	5	9	10	6	15	5	7
Moyenne			24	15	4	4	3	3	6	6	6	4
STD			22	14	3	3	1	3	8	5	2	4
Max			74.5	44	12	8	5	10	24	17	8	12
Min			0	2	0.2	0.5	1	0.2	0.24	0.32	2	0.3

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Enquêtes Novembre 1995

Villages réhabilités ou en cours de réhabilitation en Novembre 95

Villages	Sélectionnés	BTGR	Cultures					Élevage				
			fruitières	oranges	banane	manguiers	avocatier	Kolattier	bovins	ovins	caprins	volaille
1	Collah	Boke							406	249	553	
2	Kittar	Boke	15	5		10			5926	1862	1417	
3	Malenta	Boke	56	15	12	13	11	5	6043	1004	1553	
4	Termesse	Boke	40	12		28			1223	167	227	
5	Koba	Kindia	12.7	6	1.7	5			2173	305	611	
6	Missira	Kindia	36.6	15	10	11	0.4	0.2	1500	150	120	
7	Tourkoun	Kindia	9	8	1				719	66	75	
8	Belindougou	Faranah	20.5	2	3	15	0.5		4600	1340	1130	
9	Sangoya	Faranah	61	30	5		25	1	1217	527	447	
10	Kobikoro	Faranah	54.5	20	2.5	30	1	1	5240	1514	988	
11	Gberedou-Ban	Kankan	33.3	1		32		0.3	348	182	83	
12	Monbadou		34.2		5	10	19	0.2	250	68	66	
13	Belindou	Guékédou	27	9	10	3	1	4	63	35	47	
14	Ouendekere	Guékédou	13.5	0.5	1	3	1	8	1234	291	407	
15	Vasseridou	Guékédou										
16	Herico	Labé	29	3	5	6	3	12	1582	324	482	300
17	Poredaka	Labé	36.8	15	0.5	6	15	0.3	6540	3870	3049	7950
18	Donghol Touma		108.5	50	23	20	15	0.5	6404	1336	648	
19	N'zon		16	2	1	6	4	3		37	58	
20	Womey	N'zérékoré	46	15	1	10	10	10	5	120	500	
21	Koro											
22	Kokota									124	195	
Nombre de sites étudiés			18	17	15	16	13	13	18	20	20	2
Moyenne			36	12	5	13	8	4	2526	679	633	4125
STD			23	12	6	9	8	4	2404	918	708	3825
Max			108.5	50	23	32	25	12	6540	3870	3049	7950
Min			9	0.5	0.5	3	0.4	0.2	5	35	47	300

Enquêtes Novembre 1995

Villages réhabilités ou en cours de réhabilitation en Novembre 95

Villages Sélectionnés	BTGR	Organisation de la Production				Centre santé	salles classe	Nb forages	Nb artisans	maisons foles	maisons semi-dur	maisons dur	Nombre d'élèves	
		Nb Projets	NB ONG	Nb Gouprn	Infants									
1	Collah	Boke	1	1	4	1	6	5	27	100	2	385		
2	Killar	Boke	2	1	3	1	3	9	11	8	7	85		
3	Malenta	Boke			1	1	4	2	32	23	11	8		
4	Termesse	Boke	1		4	1	6	6	21	24	4	142		
5	Koba	Kindia			1	1	3	2	15	15	12	75		
6	Missira	Kindia			5	1	3	3	19	41	6	219		
7	Tourkoun	Kindia			1		2	2	10	17	2	62		
8	Beindougou	Faranah	1			0	6	3	16	9		168		
9	Sangoya	Faranah	1			1	4	4	12	39	2	120		
10	Kobikero	Faranah		1		1	4		25	52	3	90		
11	Gberedou-Bari	Kankan												
12	Morbadou								3	8				
13	Beindou	Guékédou					10	2	8	48		366		
14	Ouendekere	Guékédou	1		2	1	6	2	4	75	1	135		
15	Vasseridou	Guékédou												
16	Herico	Labé			1	1	3	1	25	42		130		
17	Poredaka	Labé			2	1	13	3	27	183	9	680		
18	Donghol Touma				4	1	30	17	179	446		1634		
19	N'zon						2	0	15	43		100		
20	Wamey	N'zérékoré	2	1	1	1	9		21	300	4	499		
21	Koro		1			1	2	1	6	40		100		
22	Kokota		1	1	3	1	7	2	28	228	8	285		
Nombre de sites étudiés			9	5	13	4	13	19	17	20	20	12	10	18
Moyenne			41%	23%	59%	18%	59%	86%	77%	25	87	6	8	293
STD									36	113	4	15	364	
Max									179	446	12	51	1634	
Min									3	8	1	0	62	

3. DATA ON VILLAGES SURVEYED, 1996

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ENQUETES octobre 1996

Sites témoins

Villages Sélectionnés	BTGR	Trafic Hébd	Trafic marché	Nb personne marché	Nb Transporteurs	Distance	Temps	Vitesse Moyenne	Hor marchandise	Coût/tonne passager	coût	Nb commerçants	Nb Etalagistes	Nb Tickets taxe	Nb mois sans trafic
1	Diguité	Boké	8	6	400	6	53	3	17.7	55000	2500	10	24	50	4
2	Tarinoys	Kindia	5	2	1050	2	45	6	7.5	55000	3000	15	32	30	0
3	Sourougamba	Faranah	0				20				3000				12
4	Laya Komboya	Faranah	4	0			8.5	1.5	5.7	20000	1500	0	3	0	4
5	Farawindou	Faranah	16				14	1.5	9.3		1000				3
6	Falindou	Guékédou	2	2	1000	2	32	2	16.0	25000	1500	15	40	50	4
7	Dabadou	Kankan	0				15	1	15.0	20000	1000	0	3	0	12
8	Massarenabakoro	Kankan	2	1	1230	1	45	3.5	12.9	25000	3000	1	3	0	7
9	Kanfrandou	Kankan	0	0	192	0	16					0	3	0	9
10	Kembara	Labé	6	6	1285	6	26	2.5	10.4	12500	2000	20	250	300	4
11	Sambalde	Labé	0	0		0	8					0	0	0	12
12	Toury	Labé	32	4	500	3	9	0.8	11.3	9000	450	9	25	0	0
13	Djinka	Labé	10				10	0.5	20.0						6
14	Aphaya	Mamou	50	13	200	6	25	0.5	50.0	20000	1500				0
15	Samba-barry	Mamou	8	4	1300	2	23	2	11.5	25000	2000	30	120	0	2
16	Kaffa	Mamou	12	6	2500	6	25	2	12.5	15000	1500	25	150	100	0
17	Balimou	N'zérékora	44	20		5	9	0.5	18.0	8000	400		4		0
18	Koule	N'zérékora	9	8	500	8	15	0.6	25.0	20000	1000	15	45	100	2
Nombre de sites étudiés			18	14	11	14	18	15		13	15	13	14	13	18
Moyenne			12	5	924	3	22	1.9	11.9	23808	1690	11	59	45	5
STD			15	5	644	3	13	1		14365	847	10	71	81	4
Max			50	20	2500	8	53	6		55000	3000	30	250	300	12
Min			0	0	192	0	8	0.5		8000	400	0	0	0	0

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Villages Sélectionnés	BTGR	Superficies emblavées											
			riz	Fonio	café	manioc	arachides	maïs	sorgho/mil	coton	autres		
1 Diguily	Boké	277	103	10		20		120		20	4		
2 Tanhoye	Kindia	84	45			2		25		2	10		
3 Sourougamba	Faranah	47	25				6	12		4			
4 Laya Komboya	Faranah	69	45	2.5			16	3		2		0.75	
5 Farawindou	Faranah	45	10				10	10		15			
6 Feindou	Guékédou	162	85			50	12	15					
7 Dabadou	Kankan	330	182	22		76	43		5				2
8 Massarenabakoro	Kankan	535	250	80		90	54		61				
9 Kanfrandou	Kankan	236	60	25		52	49		50				
10 Kembera	Labé	300	140	30		25	90		15				
11 Sambalde	Labé	71	50	3		2	6		2		5	3	
12 Touny	Labé	115	20	40		10	15		25				5
13 Djinka	Labé	113	12	33		28	14		26				
14 Alphaya	Mamou	330	56	60		65	5		18		0.5		125
15 Samba-barry	Mamou	280	80	60		25	50		65				
16 Kaffa	Mamou	200	85	55		30	15		15				
17 Balimou	N'zérékore	151	80			25	38	4	4				
18 Koule	N'zérékore	143	90			40	9	2	1.5		0.5		
Nombre de sites étudiés		18	18	12		3	18	18	17	5	2		3
Moyenne		194	79	35		38	29	30	19	4	2		44
STD		126	60	24		10	25	32	20	4	1		57
Max		535	250	80		50	90	120	65	10	3		125
Min		45	10	2.5		25	2	2	1.5	0.5	0.75		2

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Villages	Sélectionnés	BTGR	Volume total drainés/mois	cultures vivrières						Agrumes		
				riz	Fonio	café	manioc	banane	huile rouge	arachides	Fruits	autres
1	Diguity	Boké	3.1	1200	300		150	20	160	1250		
2	Tarihoie	Kindia	24.3	16000					320	8000		
3	Sourougambe	Faranah										
4	Laya Komboya	Faranah	2.1	400	200		300	800		5	400	
5	Farawindou	Faranah	62.0			2000		60000				
6	Feindou	Guékédou	25.4	1000			2000	16000	400	1500	1000	3500
7	Dabadou	Kankan	10.8	2600	1300		3200	350		800		2500
8	Massarenabakoro	Kankan	12.9	1600	2100		1800	320		2700	420	4000
9	Kanfrandou	Kankan	6.0	1920	2500		800			750		
10	Kembara	Labé	16.8	1200	600			4000		8000		3000
11	Sambaide	Labé	0.9	90						800		
12	Touny	Labé	2.7	200	300			500		500	900	300
13	Djinka	Labé	4.7		100		200	3000		50	800	500
14	Alphaya	Mamou	21.0	1500	1300		800	1500		1200	8000	6700
15	Samba-barry	Mamou	2.9	400	700		1100	323		300	100	
16	Kaffa	Mamou	7.9	800	1000			1600		2500	800	1200
17	Balimou	N'zérékore	41.2	30000		6000	900	350	1600	800	1500	
18	Koule	N'zérékore	112.2	75000		2000	6000	27000	810	1000		400
Nombre de sites étudiés			17	15	11	3	11	14	5	16	9	9
Moyenne			21	9	1	3	2	8	1	2	2	2
STD			28	19332	756	1886	1648	16166	518	2421	2313	2002
Max			112.21	75000	2500	6000	6000	60000	1600	8000	8000	6700
Min			0.89	90	100	2000	150	20	160	5	100	300

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	Villages		Cultures					élevage				
	Sélectionnés	BTGR	fruitières	oranges	banane	manguier	avocatier	colatier	bovins	ovins	caprins	volaille
1	Diguitly	Boké	22.2	0.5	20	0.7	0.4	0.6	1539	4007	4932	
2	Tarihoie	Kindia	51	15	1	25	10		172	28	89	
3	Sourougambe	Faranah	1	0.5		0.5			345	35	28	
4	Laya Komboya	Faranah	6.2	1	5		0.2		2454	528	360	
5	Farawindou	Faranah	25		25					100		
6	Felndou	Guékédou	24	5	10	1	3	5	41	60	30	
7	Dabadou	Kankan	3	1	2				763	442	228	
8	Massarenabakoro	Kankan	123	18	22	35	36	12	270	632	490	
9	Kanfrandou	Kankan	51.5	18	13	20		0.5	263	185	462	
10	Kembera	Labé	6	2	1	2	1		416	92	410	
11	Sambalde	Labé	5.3	1.3		4			616	199	253	
12	Touny	Labé	65.3	40	10	15	0.3		570	809	650	
13	Ojinka	Labé	4.2	1.3	0.6	2	0.3		495	70	1345	
14	Alphaya	Mamou	39	12	5	14	8		1250	1450	580	
15	Samba-barry	Mamou	11	4	2	1	4		1165	263	738	
16	Kaffa	Mamou	21	7	2	8	4		1957	308	673	
17	Balimou	N'zérékore	34.5	3.5	21	2	5	3	6	105	115	
18	Koule	N'zérékore	51	10	20	1	20			150	205	
Nombre de sites étudiés			18	17	16	15	13	5	16	18	17	0
Moyenne			30	8	10	9	7	4	770	526	682	
STD			30	10	9	10	10	4	691	913	1109	
Max			123	40	25	35	36	12	2454	4007	4932	
Min			1	0.5	0.6	0.5	0.2	0.5	6	28	28	

ENQUETES octobre 1996

Villages Sélectionnés	BTGR	Organisation de la Production				Centre sans salles		Nb forages	Nb artisans	maisons tôles	maisons semi-dur	maisons dur	Nombre d'élèves
		Nb Projets	NB ONG	Nb Groupes infiltrants		classe							
1 Diguity	Boké			3		1	2	2	20	31	30	1	70
2 Tarihoye	Kindia			3		1	2	2	2	9	9		58
3 Sourougambe	Faranah							1					
4 Laya Komboya	Faranah	1	1				1	1	16	19			43
5 Farawindou	Faranah	1		3	1				2	40			
6 Feindou	Guékédou												140
7 Dabadou	Kankan	1		15			1		5	5	2	3	45
8 Massarenabakoro	Kankan			3					7	5	2		
9 Kanfrandou	Kankan								1	5	2		
10 Kembera	Labé				1			2	15	12	2		86
11 Sambalde	Labé	1		2	1			2	19	12	1		172
12 Touhy	Labé			3		1		2	32	120	115	5	130
13 Djinka	Labé			2					60	75	73	2	145
14 Alphaya	Mamou	2						2	18	56	11	0	78
15 Samba-barry	Mamou		1	1		1		3	40	70	47	23	113
16 Kalfa	Mamou		2	1	1	1		3	30	78	4		145
17 Balmou	N'zérékore	2	1	3		1		4	55	240	15	4	41
18 Koule	N'zérékore	4	2			1		6	6	152	150	2	300
Nombre de sites étudiés		7	5	11	4	7	13	10	16	16	14	8	14
Moyenne		39%	28%	61%	22%	39%	72%	56%	21	58	33	5	112
STD									18	63	46	7	67
Max									60	240	150	23	300
Min									1	5	1	0	41

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Villages réhabilités ou en cours de réhabilitation en octobre 96

Villages Sélectionnés	BTGR	Trafic Hebdomadaire	Trafic journalier	Nb personnes de marché	Nb Transporteurs	Distance	Temps	Vitesse Hor Moyenne	Coût/tonne marchandises	Coût passager	Nb Commerçants	Nb Etalagistes	Nb Tickets taxe	Nb mois sans trafic	
1	Colah	Boké	72	20	3500	20	32	60	32.0	10000	2000	16	49	100	0
2	Kitar	Boké	55	14	900	5	84	120	42.0	15000	1500	30	80	50	0
3	Matenta	Boké	15	14	950	4	106	240	26.5	50000	3000	4	0	3	0
4	Termeuse	Boké	48	13	1630	7	75	120	37.5	10000	2000	155	130	130	0
5	Koba	Kindia	25	6	1225	6	73	120	36.5	20000	2000	7	200		0
6	Missira	Kindia	17	9	1875	8	93	150	37.2	30000	3000	30	150	120	0
7	Tourkoun	Kindia	12	8	3000	4	22	30	44.0	10000	1000	10	150	300	0
8	Beindougou	Faranah	103	6	150	4	28	60	28.0	10000	1500		3	0	0
9	Sangoya	Faranah	160	8	360	7	45	60	45.0	20000	2500	15	30	0	0
10	Kobikoro	Faranah	32	2	250	1	69	120	34.5	20000	4000		7	0	0
11	Gbarédou-Baranam	Kankan	10	4	2632	4	30	78	23.1	18500	1500	22	196	253	0
12	Monibidou	Kankan	40	1	50	1	37	60	37.0	18500	1500	8	12	0	0
13	Beindou	Guékédou	53			6	20	45	26.7	12000	1000		5	0	0
14	Guendekere	Guékédou	61	21	3500	21	42	60	42.0	10000	2000	90	400	88	0
15	Nasseridou	Guékédou	204	18	600	18	40	90	26.7	20000	1500	14	16	0	0
16	Harco	Mamou	34			2	62	90	41.3	20000	2500	1	7	0	0
17	Poredaka	Mamou	269	168	15000	40	56	105	32.0	20000	2500	15	265	1600	0
18	Danghel-touma	Mamou	272	95	5630	50	60	90	40.0	8000	2000	112	140	280	0
19	N'zon	N'Zérékoré	26	5	630	4	17	28	36.4	6500	500	3	14	220	0
20	Womay	N'Zérékoré	263	237	8000	35	9	12	45.0	5000	500	90	150	0	0
21	Koro	N'Zérékoré	151			8	19	35	32.6	10000	1500	5	10	0	0
22	Kokota	N'Zérékoré	46	10	910	8	15	20	45.0	5000	500	15	24	502	0
Nombre de sites étudiés			22	19	19	22	22	22	22	22	19	22	21	22	
Moyenne			89	35	2673	12	47	1.4	34.6	16841	1816	34	93	174	0
STD			87	62	3528	13	27	51	Km/h	9745	860	43	103	346	0
Max			272	237	15000	50	106	240		50000	4000	155	400	1600	0
Min			10	1	50	1	9	12		5000	500	1	0	0	0

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Villages réhabilités ou en cours de réhabilitation en octobre 96

Villages Sélectionnés	BTGR	Superficies										
		emblavées	riz	Fonio	café	manioc	arachides	maïs	sorgho/mil	coton	autres	
1	Collah	Boké	350	120	60			120				50
2	Kitiar	Boké	597	150	90		90	85	13	34	55	80
3	Maienta	Boké	890	250	100		120	200	150			70
4	Termesse	Boké	200	54	26		8	88	7	12	2	3
5	Koba	Kindia	250	100			50	70	15	15		
6	Missira	Kindia	147	147								
7	Tourkoun	Kindia	212	150	12		17	25	5	3		
8	Beindougou	Faranah	183	85	25		26	45			1.75	
9	Sangoya	Faranah	215	90	5		50	70				
10	Kobikoro	Faranah	329	115	90	10	60	40	10	3	1	
11	Gberedou-Baranam	Kankan	707	139	206		308	25	29			
12	Meribadou	kankan	765	250	145	18	253	49	50			
13	Beindou	Guékédou	180	60	4	65	13	20	6			12
14	Ouendekere	Gueckedou	108	84		18	2	0	2			2
15	Vassendou	Gueckedou	92	59			8	15	10			
16	Herico	Mamou	167	35	19	6	30	18	20	1		38
17	Poredaka	Mamou	90	18	27	9	7	15	12	2		
18	Donghol-touma	Mamou	936	600	160	9	52	97	18			
19	N'zon	N'Zérékoré	245	120		54	38	23	7	3		
20	Womey	N'Zérékoré	91	30		55	6					
21	Koro	N'Zérékoré	146	25		105	10	6				
22	Kokota	N'Zérékoré	324	150		106	35	20	6	7		
Nombre de sites étudiés			22	22	14	11	20	20	16	9	4	7
Moyenne			328	129	69	41	59	52	23	9	15	36
STD			261	120	62	36	80	47	35	10	23	30
Max			936	600	206	106	308	200	150	34	55	80
Min			90	18	4	6	2	0	2	1	1	2

Villages réhabilités ou en cours de réhabilitation en octobre 96

Villages Selectionnés	BTGR	Volume total drainés/mois	cultures vivrières						Agrumes			
			riz	Fonjo	café	manioc	banane	huile rouge	arachides	Fruits	autres	
1	Coliah	24.2	4000	2000					3200	15000		
2	Kiliar	13.8	2400	1600		6000				1800	2000	
3	Malenta	18.5	3500			8000				2500		4500
4	Termesse	27.6	16000	4800						4800		2000
5	Koba	66.0	36000			16000	2000	2000	8000			2000
6	Missira	133.6	64000				4000	9600	56000			
7	Tourkoun	142.0	54000	12800		36000		3200	36000			
8	Beindougou	46.0	32000	12000			2000		8			
9	Sangoya	8.3	600	320		2520			820	4000		
10	Kobikoro	23.7		8800		8900			4000	2000		
11	Gberedou-Baranam	42.6		24000		13000			5600			
12	Monbadou	52.4	6400	8000		8000	1200		10800	2000	16000	
13	Beindou	112.0	8000			12000	60000			32000		
14	Ouendekere	142.8	16000	400		72000	48000	1600	800	4000		
15	Vasseridou	409.6	3200		400	2400	400000		2400		1200	
16	Henco	122.0	61000	1600		12000	160	1240	8000	6000	32000	
17	Poredaka	109.8	2000	4000	200	1200	8000	2400	48000	36000	8000	
18	Donghol-tourna	96.5	40000	2000		2500	30000		10000	12000		
19	N'zon	74.9	6000		2400	48000	12000	2500	4000			
20	Womey	76.0	8000		40000	2800	12000	4800	5600	2800		
21	Koro	80.0	28000		32000	2000	4000	8000	6000			
22	Kokota	76.0	10000		5000	17000	24000	16000	4000			
Nombre de sites étudiés		22	20	13	6	18	14	11	21	10	7	
Moyenne		86	20	6	13	15	43	5	11	10	9	
STD		82	20321	6542	16270	18259	100507	4321	15247	12227	10400	
Max		409.6	64000	24000	40000	72000	400000	16000	56000	36000	32000	
Min		8.26	600	320	200	1200	160	1240	8	2000	1200	

Villages réhabilités ou en cours de réhabilitation en octobre 96

Villages	ETGR	Cultures					Célestes					
		fruitières	oranges	banane	manguier	avocalier	autres	bovins	ovins	caprins	volaille	
1 Caliah	Boké											
2 Kiliar	Boké	29	8	1	20			5926	1862	1147	760	
3 Malenta	Boké	98	15	62	13	8		16364	2842	4870	985	
4 Termesse	Boké	53	13	12	28			1224	171	229		
5 Koba	Kindia	45	20	3	13	2	7					
6 Missira	Kindia	33	17		13	1	2					
7 Tourkoun	Kindia	30	13	9	4	2	2	326	44	32		
8 Beindougou	Faranah	27	7	13	7			319	139	63		
9 Sangoya	Faranah	80	30	5	20	25		1217	527	444		
10 Kobikoro	Faranah	75	19	5	30	13	8	6572	1264	995		
11 Gbareidou-Baranam	Kankan	47	3		43		1	6401	1723	1911		
12 Moribadou	kankan	53	18	13	20	1	1	6911	2569	3001		
13 Beindou	Guékédou	22	2	14	3	1	2	72	65	70	225	
14 Ouendekere	Gueckedou	65	4	50	8	2	1	0	47	44		
15 Vassendou	Gueckedou	63	2	60	1			5029	981	644	100	
16 Henico	Mamou	28	12	5	8	3		1582	324	482		
17 Poredaka	Mamou	60	15	8	20	15	2	1064	2495	1497		
18 Donghol-touma	Mamou	109	50	23	20	15	1					
19 N'zon	N'Zérékoré	25	2	10	7	5	1	0	610	450	370	
20 Womey	N'Zérékoré	62	16	15	10	10	11	5	32	500	600	
21 Koro	N'Zérékoré	34	2	30	2			0	540	396	9000	
22 Kokota	N'Zérékoré	43	15	15	6	7		0	60	160	600	
Nombre de sites étudiés		21	21	19	21	15	12	18	18	18	8	
Moyenne		51	13	19	14	7	3	2945	905	941	1580	
STD		24	11	18	10	7	3	4155	950	1214	2817	
Max		109	50	62	43	25	11	16364	2842	4870	9000	
Min		22	2	1	1	1	1	0	32	32	100	

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Villages réhabilités ou en cours de réhabilitation en octobre 96

Villages Sélectionnés	BTGR	Organisation de la Production				Centre santé-salles classe		Nb forages	Nb artisans	maisons tôles	maisons semi-dur	maisons dur	Nombre d'élèves	
		Nb Projets	NB ONG	Nb Group	Intrants									
1	Coliati	Boké	1	1	4		1	6	5	27	100		2	385
2	Kittar	Boké	1		1	1		2	4	9	23	18	8	76
3	Malenta	Boké	1		1		1	3	33	13	34	5	29	141
4	Termasse	Boké		1	4	1		4	42	15	24	5	3	125
5	Koba	Kindia			1		1	3	3	14	10	9	1	114
6	Masira	Kindia	1		13		1	6	3	14	57	54	3	256
7	Tourkoun	Kindia			1			2	2	15	47	39	8	45
8	Beindougou	Faranah	3				1	3	3	10	13	7	6	147
9	Sangoya	Faranah		1			1	5	4	1	39	37	2	123
10	Kobikoro	Faranah	1		1		1	3		7	68	4		106
11	Gberedou-Baranam	Kankan					1	10	5	15	15	3		521
12	Moribadou	Kankan	1					1		2	9	3	2	
13	Beindou	Guékédou	2	2	5		1	10	2	8	43	2	2	406
14	Quendekere	Guékédou	1	1	2		1	9	2	4	79	3		151
15	Yasseridou	Guékédou	1		3	1	1			5	42	1		
16	Henca	Mamou			1			3	1	26	47		6	126
17	Poredaka	Mamou	1	1	6	1	1	14	35	28	202			817
18	Danghol-touma	Mamou			5		1	30	17	179	446		51	1634
19	N'zon	N'Zérékoré	2		3			3	1	9	108	106	2	151
20	Womey	N'Zérékoré	2	1	1	1	1	11	2	25	312	5	3	579
21	Koro	N'Zérékoré	1	1	2		1	2	1	4	150	4		142
22	Kokoia	N'Zérékoré	2		7		1	11	2	15	129	13	5	321
Nombre de sites étudiés			15	8	18	5	17	21	19	22	22	18	16	20
Moyenne			68%	36%	82%	23%	77%	95%	86%	20	91	10	6	318
STD										36	105	26	13	360
Max										179	446	106	51	1634
Min										1	9	1	1	45

4. Illustrations of Roads Before and After Rehabilitation

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IMPACT ON THE MARKETS



Even though the road has not been completely rehabilitated, the market at Coliah, on the Boffa-Coliah road, has developed considerably (June 1996).



The market at Timbi-Madina, on the Ore Passo-Timba-Madina road, has expanded considerably since the rehabilitation of the road in 1994. Several thousand people come to buy and sell their products.



The road from Lola to Gbata in June 1994



The same road in June 1996



The road from Boffa to Kolia



In the midst of rehabilitation in June 1996



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The Lola-Foumbadou road in November 1994



In June 1996, vehicles travel between Lola and Foumbadou without difficulty.



A dangerous wood bridge in November 1994, before the rehabilitation of the Lola-Gbata road.



In June 1996, a permanent bridge allows vehicles to use the road throughout the year.

