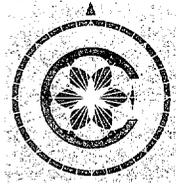


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CHEMONICS INTERNATIONAL INC.

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PROJECT MONITORING AND EVALUATION SYSTEM
GUINEA NATURAL RESOURCES MANAGEMENT PROJECT

Contract No. 624-0219-C-00-2094-00

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EXECUTIVE SUMMARY

This report describes the monitoring and evaluation system for the Guinea Natural Resources Management (NRM) Project. The report is divided into three parts. Section I provides an overview of the logic, content, and orientation of the monitoring system, and Section II offers a detailed set of guidelines for implementation. A budget for December 1995 to December 1996 is included as Annex B.

This work was completed in collaboration with the principal consultant, Mr. Tidiane Traoré of Management Consultants, S.A.R.L. Conakry, retained to provide baseline and socio-economic surveys and some aspects of bio-physical monitoring to the project.

Field instruments and the design of the data management system were developed in collaboration with the DNFF data management trainee, Mr. Morlaye Keita and the Management Consultants team over a seven-week period (October to early December 1995).

Data collection and analysis cover four streams of data:

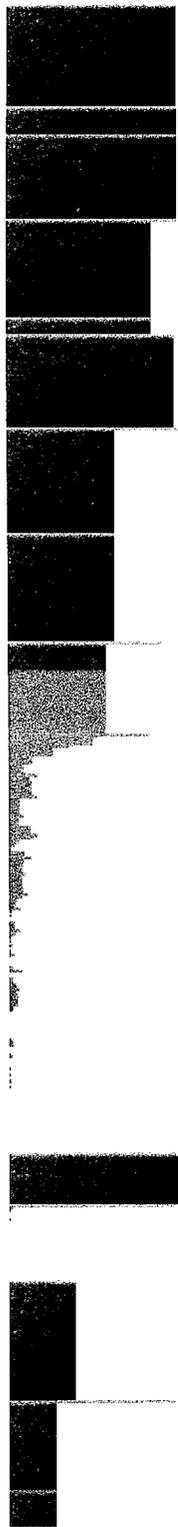
- The first provides information on the bio-physical changes in the status of the natural resource system (water flows, soil accumulation and fertility, forest cover, etc.), which are related to long- and medium-term project interventions.
- The second data stream is comprised of baseline and subsequent socio-economic surveys that are analyzed to show how the target population develops economic strategies for the use of their natural resources from year to year.
- The third data stream is derived from specifically focused studies and close tracking of short-term intervention inputs and outputs aimed at improving the economic well-being of its beneficiaries. This typically includes simple cost-benefit analyses of enterprises or interventions designed to raise income, such as apiculture, market gardening, etc.
- The final data set pertains to market-related phenomena, chiefly measures of transport and market efficiency.

Analytical outputs are linked to the NRM framework and the related project goal and purpose.

A new sample of 90 households will be followed yearly to establish measures of income, income sources, and well-being.

SECTION I

DESCRIPTION OF THE MONITORING AND EVALUATION SYSTEM



SECTION I

DESCRIPTION OF THE MONITORING AND EVALUATION SYSTEM

A. Overview

The monitoring and evaluation system for the Guinea Natural Resource Management (NRM) project must satisfy the following requirements:

- Measure socio-economic impacts.
- Measure bio-physical changes in the natural resource base.
- Track adoption rates and define the characteristics of adopters.
- Link monitoring outputs with the larger NRM framework.
- Link monitoring outputs with the project goal and purpose as set forth in the logical framework.

The goal of the project is *to increase sustainable agricultural and value-added production by men and women for domestic and export markets*. Its purpose is *to improve the management of natural resources in the target watersheds for profitable and sustainable agricultural production*. The two are linked in the implementation process through (1) long- and medium-term investments in the natural resource base, and (2) short-term interventions for rural economic development.

Short-term investments that promote economic growth serve to encourage and sustain long-term investments, which will result in durable gains in natural resource productivity. The monitoring system must gather data needed to measure and assess the pay-offs from short-term and long-term investments. The project can thus be evaluated, and the lessons learned can be applied to similar endeavors.

The system also provides the data needed to understand better the relationship between socio-economic activities and bio-physical changes in the natural resource base. Monitoring socio-economic interventions is an important management information tool because this feedback can be used for making decisions, selecting appropriate interventions, and making mid-course corrections.

This technical paper focuses on the socio-economic component of the project's M&E system. Bio-physical interventions are by nature long-term investments and cannot be expected to have a significant impact during the current phase of the project. Nevertheless, socio-economic monitoring and analyses are structured to reflect bio-physical improvements as they are manifested.

The monitoring system for the Guinea NRM project is built on the following data streams:

- Bio-physical changes in the status of the natural resource system (water flows, soil accumulation and fertility, forest cover, etc.) that are related to long- and medium-term project interventions.
- Baseline and subsequent socio-economic surveys to provide data on how the target population plans their yearly natural resource strategies.

- Focused studies and close tracking of short-term intervention inputs and outputs aimed at improving the economic well-being of beneficiaries. This includes simple cost-benefit analyses of enterprises or interventions designed to raise income (e.g., apiculture, market gardening, etc.).
- Market-related phenomena, chiefly measures of transport and market efficiency.

The next section discusses sample selection and related issues. Section C reviews the details of data sets and analytical methods used to measure impacts on income and well-being, and to inform project management of the gains made as a result of specific interventions.

B. Sample Selection

A new, random sample of 90 households, just over 10 percent of the households in the three watersheds, will be selected. The sample will be weighted in proportion to the population of each watershed as shown in the table below. An additional three households will be added to each watershed to cover drop-outs. This sample will be monitored annually over the life of the project. Electoral lists will be used for each watershed as a basis for random selection.

<i>Watershed</i>	<i>No. of Households</i>	<i>Sample Size</i>
Koundou	314	33 (+3)
Diaforé	228	25 (+3)
Dissa	297	32 (+3)
Total	839	90 (10.75 percent)

Baseline data on hand from the initial sample of 150 households appear largely adequate. Given its size (150 households, just over 18 percent of the target population), this sample *could* have been retained for subsequent annual surveys. However, technical questions posed by the mid-term evaluation team challenged its validity and reliability. The data sets used in the first socio-economic survey are largely sufficient to establish a baseline, but in view of the confusion resulting from the evaluation report, the M&E consultants have opted to undertake the survey described in this document. The data from this first baseline survey should be summarized and reviewed, however.

C. Review of Data Collection Tools

C1. Demographic Modules (D-1 Household Status; D-2 Migrant Contributors)

DEMOGRAPHIC MODULE D-1												
Household Status												
Household No.:				Village:				Watershed:				
Name of Field Worker:							Date:					
MALE				Occupation		FEMALE				Occupation		
Name	Age	Labor Units	Title	Principal	Second.	Name	Age	Labor Units	Title	Principal	Second.	
1												
2												
3												
4												
5												
6												
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19												
20												
TOTAL MALES:						TOTAL FEMALES:						
Total Without Migrants:						Total Without Migrants:						

DEMOGRAPHIC MODULE D-2							
Migrant Contributors							
Name	Age	Sex	Town, Region, Country	Occupation	Migrant Type	Annual Contribution	Observations

- Net income per crop

C3. Livestock Inventory Module

MODULE: LIVESTOCK				
Livestock Inventory				
Household No.:		Village No.:		Watershed:
Name of Fieldworker:				Date:
Species	No. Units	Conversion Factors (GF)	Annual Value (GF)	Observations
Cattle				
Sheep				
Goats				
Fowl/Species				
Apiculture Improved Beehives				
Traditional Beehives				
Others				

Inputs: Number of head by species and number of beehives.

Outputs are derived using conversion factors for net earnings from herd off-take to establish a measure of *annual income by species per statistical head* (unit of livestock). Data sources for off-take conversions include the Ministry of Livestock, ILCA, and other studies.

Outputs include:

- Number of livestock by species per household
- Estimated income from livestock, by species
- An estimate of the aggregate number of livestock by species per watershed

C4. Artisanal Production, Petty Trade, and Wage Labor Module

ARTISAN PRODUCTION, PETTY TRADE, AND WAGE LABOR MODULE				
Household No.:		Village No.:		Watershed:
Name of Fieldworker:			Date:	
Type of Activity	No. H	No. F	Revenue Observations	
Blacksmith				
Weaving				
Dyeing				
Soapmaking				
Shoemaker				
Carpenter/Cabinet Maker				
Mason/Bricklayer				
Merchant/Store Keeper				
Hunter				
Other				

Inputs:

- Types of income sources
- Gender of income producers
- Production costs of goods or services

Outputs are derived using prevailing values for labor and services by activity to establish:

- Net income for activities identified in the sample
- Net income by activity by gender using a simple cost-benefit analysis.

C5. Analysis of Baseline and Annual Socioeconomic Surveys

This section reviews the data inputs and analytical outputs from socio-economic surveys. It discusses the use of analytical outputs with respect to the larger NRM framework, the mission's Strategic Objective No. 1, and the project's goal and purpose.

Analyses of annual socio-economic surveys reveal the strategic deployment of labor and other resources available to the populations in the watersheds. Knowledge of the actual use of land, labor, and scarce capital by potential beneficiaries is a prerequisite to the strategic planning and design of appropriate interventions. Annual repetitions of the survey will clearly reflect changes in *income and well-being*.

Data from the above modules (with the exception of the health module) is assembled and analyzed to produce a number of outputs and indicators. One important output is the *rice basket index* which shows all net income sources converted from a value in Guinean francs into an *equivalent* in staple rice. The “rice basket” is built using the *average annual price for rice and commodities* converted into a rice equivalent, assuming that the price of rice is relatively stable over the year. Given current government policies which support price stability for rice, this basic staple appears to be a relevant benchmark.

Ideally, conversions would be made on the basis of actual monthly, or even weekly, fluctuations in rice and commodity prices at the time of exchange or conversion. However, the monitoring of transactions in detail is not cost-effective, and the additional gain in accuracy would be marginal, yielding little additional information about the relative importance of each activity sector to the household economy. In the event that the price of rice in the target watersheds does vary significantly, monthly monitoring of rice and other commodity prices in local markets will supply the data needed to refine conversion values. *Any* commodity for which the price is relatively stable could be used. The key point is not the actual value of rice but the establishment of a benchmark for conversions to assess the returns from each economic option (or activity sector) used by sample households.

The rice basket index is expressed in kilograms of rice per capita per day for each household and shows the average for each watershed sample group. It is important to bear in mind that subsistence-oriented economies must first satisfy basic food requirements for the household.

The rice basket measure (kg/capita/day) serves as an index of food security and well-being for the household and provides the project with a relevant baseline and annual measures for individual households and the sample group for each watershed. This is needed to assess the level of income for NRM Level V indicators (productivity and income changes).

The index can be interpreted using Food and Agriculture Organization (FAO) or other objective measures of basic food requirements and can be interpreted in terms of the mean or median values found in the sample. The rice basket technique also provides a clear differentiation of households based on their labor capacity, access to resources, and strategic choices. It may be the case that households showing higher values on the index are the most progressive adapters.

The size and relative importance of each activity sector (agriculture, stock-raising, artisanal and other income, and migrant remittances) making up the annual household rice basket reveal the target population’s economic strategies for deploying of labor and using resources. In addition to facilitating the measurement of income and well-being needed to gauge impacts, this analysis gives implementors an image of what people *really* do. Knowledge of actual strategies used by the population is obviously useful when undertaking participatory rural appraisals or similar activities.

A representative analytical table using fictive data illustrates some of the uses of the rice basket technique (see next page).

Exhibit I-1. Summary of Data (data for illustrative purposes only)

Summary of Data										BRP: Example								
Village	House-	Group	M	F	CTM	CTF	CTT	MIGR	Agriculture	Livestock	Artisans	Migrants	Total	GF/head	Total in	Rice/	P : C	
Number	No.	No.	No	No.	UT	UT	UT	No.	GF	GF	GF	GF	GF	GF	Rice	Head	1:xx	
1	AA	A-1	23	11	12	7.25	7.75	15.00	1	500,000	30,000	36,000	50,000	616,000	26,783	1,232	0.15	1.53
2		A-2	24	13	11	9.50	8.00	17.50	0	759,000	555,666	121,000	0	1,435,666	59,819	2,871	0.33	1.37
3		A-3	8	4	4	2.50	2.50	5.00	1	456,000	176,000	134,000	50,000	816,000	102,000	1,632	0.56	1.60
4		A-4	16	9	7	5.75	6.00	11.75	1	21,345	333,777	27,262	50,000	432,384	27,024	865	0.15	1.36
5		A-5	16	8	8	4.75	5.00	9.75	1	123,456	111,222	94,949	50,000	379,627	23,727	759	0.13	1.64
6	BB	B-1	14	5	9	3.00	8.00	11.00	2	967,886	111,888	72,727	100,000	1,252,501	89,464	2,505	0.49	1.27
7		B-2	13	8	5	4.25	9.00	13.25	2	233,333	888,123	34,256	100,000	1,255,712	96,593	2,511	0.53	0.98
8		B-3	14	3	11	1.00	6.00	7.00	3	234,567	234,587	23,498	150,000	642,652	45,904	1,285	0.25	2.00
9	CC	C-1	16	9	7	6.25	7.00	13.25	4	123,098	888,888	23,456	200,000	1,235,442	77,215	2,471	0.42	1.21
10		C-2	18	9	9	7.00	8.00	15.00	2	333,456	999,999	76,578	100,000	1,510,033	83,891	3,020	0.46	1.20
11																		
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	Total:		162	79	83	51.25	67.25	118.50	17.00	3,752,141	4,330,150	643,726	850,000	9,576,017	632,420	19,151	3.47	14.16
	Average		5	2.6	2.8	1.71	2.24	3.95	0.57	125071	144338	21458	28333	319201	21081	638	0.12	0.47
	Percent:									39	45	7	9					

C5a. Primary Outputs

The following lists show many of the potential outputs and analyses which *could* be derived from the analytical table. It is not suggested that *all* these outputs are needed for monitoring and measuring impact of the project. However, the many analytical uses of the data will allow the technical assistance team to undertake specific analyses to help them implement the program or assess potential impacts.

Demography:

- Total sample population
- Average household size and composition, by gender
- Average labor capacity by household, by gender
- Average number of migrants per family, by gender
- Migrant contributions, by age and gender
- Percentage (and number) of children in school, by gender

Income and well-being:

- Value of agricultural output, by family, gender, crop, and field
- Value of pastoral production, by species and gender
- Value of artisanal production, trade, and employment, by family and gender
- Value of external income (remittances)
- Average income for sample
- Average income per household
- Return to labor, by crop (for men and women)
- Percentage of total income from each income-generating sector (agriculture, livestock, remittances and trade, artisanal production, and employment)
- Return to labor from each income-generating sector, by gender
- An index of producers to consumers (showing subsistence requirements versus available labor)
- A ranking of households, by income per capita
- A ranking of households on a subsistence index (shown as rice equivalent per capita per day)

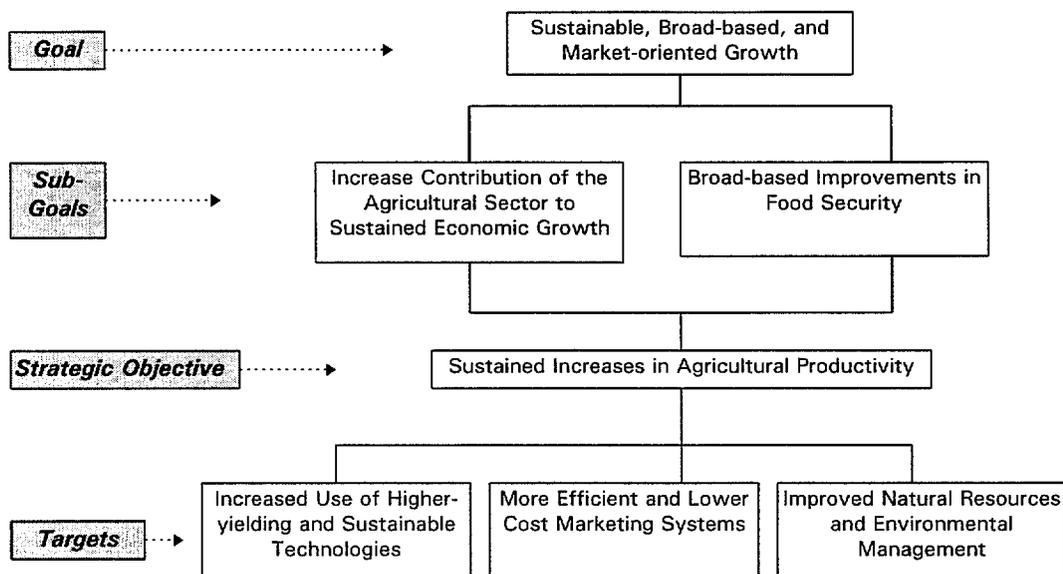
C5b. Analytical Uses of Primary Outputs

The following assesses the analytical uses of the outputs for a number of purposes.

For NRM Framework Level V: Strategic Objective No. 1-Productivity and Income Changes. The Objective Tree linking the NRM framework to the Strategic Objective No. 1 (SO1) is shown below. This chart, taken from the Plan for Supporting Natural Resources Management in Sub-Saharan Africa, USAID, Africa Bureau in May 1992, serves as a basis for the discussion that follows. The plan cites the importance of the objective tree for design, evaluation, monitoring, and reporting as follows:

As a tool for effective program and project design, impact monitoring, and evaluation, the Africa Bureau has developed the Agriculture and Natural Resources Sector Objective Tree (shown below). This objective tree graphically summarizes: (1) the relationship of sustained increases in agricultural productivity to the USAID Africa Bureau goal of sustainable, broad-based, and market-oriented growth; and (2) the three targets that are necessary to achieve the strategic objective of sustained increases in agricultural productivity. Thus, this objective tree links the critical target of (1) improved natural resources and environmental management with complementary targets of (2) more efficient and lower cost marketing systems, and (3) increased utilization of higher yielding and sustainable technologies to the DFA objective of long-term, sustained increases in agricultural productivity. This objective tree is now utilized as a guide for the Bureau in the programming of sustainable agriculture, natural resources management and environmental assistance to the field.

Figure I-1.
OBJECTIVE TREE: Agriculture & Natural Resource Sector



Field data can be analyzed to:

- Establish mean and median income levels of sample households.
- Establish the subsistence level of sample households.
- Determine the respective contribution of agriculture and other activity sectors to household income and subsistence status.
- Measure the impact of specific agricultural and enterprise interventions on household income and subsistence status.
- Measure the impact of relevant agricultural and enterprise interventions on productivity and production.

These measures can be made in the context of the global household economy (all activity sectors) or with reference to a specific sector such as agriculture and presented in the form of statistical tables or charts.

For NRM Framework Level IV: Natural Resource Base. Project personnel will track longer-term interventions according to established bio-physical measures (e.g., water flow of springs and rivers, land-use patterns, etc.).

Impacts related to increased productivity of land, water, and other natural resources will be seen in the analytical framework as changes in the size and composition of relevant activity sectors such as agriculture and livestock. In addition to routine bio-physical monitoring, the data collection procedure also tags economic and bio-physical interventions to sample household fields. This permits specific assessments of productivity, production, and income where such interventions coincide with sample households.

DNFF tracking will be required in the post-project period to measure these long-term impacts. *A suggested proxy for DNFF in the post-project period is the extent of external fields and the length of fallow periods.*

DNFF and/or a donor may wish to re-administer the survey at a later date after bio-physical changes are thought to be present. As suggested in the NRM Indicator Catalogue (see Annex II of the Plan for Supporting Natural Resources Management in Sub-Saharan Africa, USAID, 1992), this type of survey might be carried out at intervals of five or ten years to assess changes in bio-physical indicators and economic activities of the population and changes in the relationship between economy and the environment.

For NRM Framework Level III: Adoption of Practices. Rates of adoption are not classified as impacts; they are progress indicators that the technical assistance team will track practice by practice. However, the analysis of the data collected in baseline and socio-economic surveys will reveal the economic and social characteristics of adopters tagged in the field research instruments (see above). This information can help implementors identify the characteristics of adopters and non-adopters and thus accelerate adoption by focusing support.

For the Project Logical Framework: Goal. According to the logical framework, the project's goal is "increased sustainable agricultural and value-added production by men and women for domestic and export markets." The objectively verifiable indicators are:

- Increased output from gross primary agricultural activities
- Increased output from NRM-based rural industrial activities

The data and measurements needed to satisfy the above indicators are drawn from the production modules and tracking of rural enterprises over the life of the project. From the beneficiaries' point of view, agriculture is important in terms of its size and relative contribution to household income and subsistence status (rice basket measure).

As stated in the sections above that detail inputs and outputs, the following outputs are used to link project interventions and activities to the goal indicators:

- Indicator: Output from gross primary agricultural activities
 - ◊ Gross production, by crop and field type (from baseline and annual surveys)
 - ◊ Aggregate number of livestock, by species (from baseline and annual surveys)
- Indicator: Increased output from NRM-based rural industrial activities
 - ◊ Progress tracking of project-supported enterprises, to show the number and types of enterprises and their revenue.

For the Project Logical Framework: Purpose. Attainment of the project purpose—“to improve the management of natural resources in three target watersheds in the Fouta Djallon Highlands for profitable and sustainable agricultural production”—is to be verified by the following:

- Indicator: increased private investment target watersheds
 - ◊ Number and types of enterprises developed in the watersheds
 - ◊ Amount of credit extended to enterprise and agricultural development

C6. Other Data Requirements

C6a. Health Status Module

<i>HEALTH STATUS MODULE</i>		
<i>Biannual</i>		
<i>Household No.:</i>	<i>Watershed:</i>	
<i>Name of Field Worker:</i>	<i>Date:</i>	
	Number of Cases in the Last Two Weeks	
	Male	Female
Diarrhea		
Fever		
Skin diseases		

Inputs: The number of cases of fever, diarrhea, and skin rashes using a recall period of two weeks. (A two-week recall period is recommended to assure high quality data by health survey professionals).

Outputs: Frequency of indicated symptoms for the sample at mid-dry and mid-rainy seasons. This output may be correlated to water supply and water quality improvements undertaken by the project.

- Percentage reduction in transport time between watersheds and key markets

C6c. Monitoring Agricultural Commodity Production and Markets

The market price module is used in both watershed and urban markets to monitor selected commodity prices.

MARKET PRICE MODULE					
Watershed:			Market Location:		
Name of Field Worker:			Date:		
Commodity	Measurement unit	Equivalence (kg)	Price per unit	Price per kg	Observations
<i>Agricultural Products</i>					
Rice					
Maize					
Peanuts					
Fonio					
Millet					
Sorghum					
Manioc					
Sweet Potato					
Taro					
Onion					
Potato					
Okra					
Tomato					
Small Hot Peppers					
Beans					
<i>Cattle / Livestock</i>					
Bulls (5 years)					
Cows					
Veal (less than one year old)					
<i>Sheep</i>					
Rams					
Ewes					
<i>Goats</i>					
Billy goats					
Nannie goats					
Chickens					
Honey					
Other (specify)					

Inputs:

- Farmgate prices for selected commodities, by watershed
- Urban market prices for same selected commodities

Outputs:

- Differential between farmgate and urban market prices
- Ratio of consumer price to producer price (percentage)

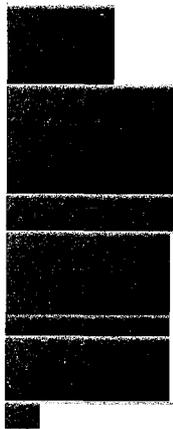
C6d. Financial Intermediation - Credit

Inputs:

- Number of loans for agricultural production
- Number of loans, for rural/small enterprises
- Total value of loans by types and gender (above)
- Baseline repayment rate (percentage)

Outputs:

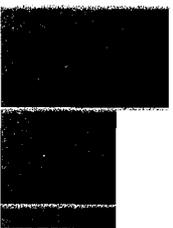
- Change in number of loans, by type and gender
- Change in value of loans, by type and gender
- Percentage of new loans to agriculture
- Change in average value of loans, by type and gender
- Change in repayment rates



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SECTION II

GUIDELINES FOR FIELDWORKERS



SECTION II
GUIDELINES FOR FIELDWORKERS

A. Demographic Modules

The survey period for demographic modules is annual, beginning in January.

Female fieldworkers will administer the demographic modules, where possible. The family status module (D-1, household status) should be completed first after the sample has been identified. This module should be re-administered at the same time each year.

It is highly preferable to interview older women and men to obtain demographic data. Because women are responsible for reproduction, they remember family members' ages and other information about them, especially the whereabouts and activities of migrants.

Administration of the demographic module (D-1) follows these steps:

Step 1: List all members of the household by name and age for each sex, starting with the oldest and finishing with the youngest. In the "title" cells, indicate the individuals' household position, for example, elders-grandparents, head of household, wife-1, wife-2, sons, daughters, adopted children, relatives, or others.

Include *all* people living and eating in the household. This might include kinsfolk from other households, children of relatives, adopted children, etc. *All people working and eating in the household must be included in the demographic module.*

Step 2: Using the table below as a reference, code all household members by age group and enter the labor value for each member.

Household Members, by Age and Units of Labor							
Ages	0 to 5	6 to 10	11 to 15	16 to 20	21 to 25	26 to 30	31 to 35
Category	A	B	C	D	E	F	G
UL	0.00	0.25	0.50	1.00	1.00	1.00	1.00
Ages	36 to 40	41 to 45	46 to 50	51 to 55	56 to 60	61 to 65	66 +
Category	H	J	M	N	O	P	Q
UL	1.00	1.00	1.00	1.00	0.75	0.25	0.00

Step 3: Use the occupation codes in the table below to assign a primary and secondary occupation to each household member.

<i>Occupation Codes</i>	
01	Agriculture/farmer
02	Herder
03A	Migrant contributor, visiting periodically
03B	Migrant contributor, resident
04	Migrant, non-contributing, absent
05	Artisan/Craftsman
06	Laborer
07	Trader/Tradesman
08	Other (e.g., hunter, fisherman, etc.)
09	Senior Citizens or Invalids
10	Student

The fieldworker should ask the informant(s) what *they* consider to be their *primary* and *secondary* occupations. For example, an individual may describe himself as a herder, and give a second occupation as farmer or artisan. These classifications apply to working household members only.

Step 4: List the migrants identified in the D-1 module who contribute to the household economy in the D-2 module (migrant contributors).

The identification of migrants allows an accurate estimation of outside support for the household, which determines the complete economic support base.

For each migrant identified in the male and female listings, obtain and code the following information and register it in the D-2 module.

- List the name and age group in the appropriate column for males or females.
- Indicate the place and country of residence for each migrant-contributor (Type 03A).
- Indicate the occupation, if known, such as laborer, taxi man, trader, etc., for each migrant-contributor.
- Under "Type" enter **S** for seasonal or **P** for permanent. A permanent migrant is an individual who resides and earns his/her living away but may visit from time to time. A seasonal migrant is typically an individual who participates actively in the household economy but may leave during periods of low activity to earn supplementary income.

Step 5: The last and critical step in the demographic module is the collection of data on migrant remittances. Fieldworkers should take their time obtaining answers to this question and approach the topic from several perspectives (to be elaborated during training).

Migrant contributions can take the form of foodstuffs such as sacks of rice or drums of oil; it can also include money, consumer goods, and other items. List all items on the D-2 migrant data form; use the back of the form if more space is needed.

Try to obtain the value of items, if known, because all contributions will be converted into an approximate value in Guinean francs. Please note if migrants send regular, perhaps monthly, amounts to the family.

Three types of field modules are used to establish inventories of activities and resources. Additional studies or secondary sources and reference to research findings will be used to derive conversion values to determine income from each economic option or activity sector used by the population. The first of these is agriculture.

B. Agriculture Modules

The survey periods for field measurements are May through June for rain-fed fields and October through November for gardens. The survey periods for yield measurements are August through December for rain-fed crops and January through February for garden crops.

Establish an inventory of agricultural production. List the dimensions of *all fields* cultivated by sample households on the appropriate form (A-1-A for tapades; A-1-B for Bas-fonds; and A-1-C for exterior fields).

Indicate crop(s) for each field. Under the observations column, note if intercropped, for example, with wild maize and beans. Where the household has sown different varieties of the same crop, such as improved and traditional rice, indicate these varieties to assure accuracy in yield sampling.

Determination of Yields. It is essential that yield data is accurate and reliable, not only for socio-economic analyses, but also for bio-physical measures needed to correlate fertility to production. *Fieldworkers will be assisted by trained agro-technicians in yield sampling.*

The following procedures are to be strictly applied in determining crop yields.

Step 1. Select a representative sample area in the field. If the field is homogeneous (with a crop of uniform density and quality), select a typical area of 10m x 10m (100 m²) for the sample. If the field has a high variance in density and quality, select three sample areas of 3m x 10m (30 m²) to measure high, medium, and low yield areas, and aggregate to determine the average.

Step 2. Harvest the sample areas and weigh production as per procedure for each crop.

Step 3. Watershed fieldworkers are responsible for measuring *all fields* during the period between land preparation and seeding; yield determination will be undertaken under the direction of agronomic technicians at harvest time. The agronomic technicians will be trained in the precise procedure for each crop.

Step 4. Use the following yield measurement for each crop:

<i>Crop</i>	<i>Unit of measurement</i>
Rice	Paddy in kg
Maize	Dried grain in kg

Peanuts	Shelled in kg
Fonio	Dried grain in kg
Millet/sorghum	Dried grain in kg
Cassava	Tubers in kg
Sweet potato	Tubers in kg
Taro	Tubers in kg
Beans	Dried and shelled in kg
Garden crops	Units and or weights in kg
Fruit trees	Units and or weights in kg

Techniques for yield measurement vary by type of crop. Cereals are measured using the same technique, with the exception of maize (which must be removed from the cob and dried before weighing).

The production from yield sample areas for *rice, fonio, sorghum and millet* is to be taken as raw, unshelled grain (i.e., paddy for rice; fonio, sorghum, or millet in the husk). The sample quantity is to be put up in sack and weighed. Conversion factors for humidity and husked, cleaned grain will be used later by analysts during data inputting.

Maize must be dried and removed from the cob before weighing. This requires good control of the quantities harvested and stocked for later measurement. The time lag between harvest of the sample and weighing is about 4 to 6 weeks.

Yield samples of *groundnuts (peanuts) and beans* are to be weighed wet in the shell immediately after harvest. As with cereals, conversion factors for the dry, unshelled product will be made at the data input stage. If the conversion factor is unknown or uncertain, a 100-kg bag of wet product in the shell will be dried to determine the net, dry, unshelled weight. This procedure will apply to any crop whose conversion factor is in question.

Tuber crops (*cassava, sweet potato, and taro*) are weighed at harvest time. No conversion factor is applied.

Likewise, *garden produce (pulses, vegetables, etc.)* are to be weighed directly upon harvest. It may be the case that local measures such as sacks, baskets, or bundles are used. In such cases, the metric equivalent should be determined by weighing a sample of local measures.

Measurement of *fruit tree production (citrus, mango, avocado, and banana)*, is applied only in instances where the household derives income from sales. In cases where fruit trees or banana plantations are important to household income, the essential unit of measurement is the *actual income*. For fruit trees with seasonal production, an estimate of the produce sold and its net value to the household is needed. For banana plantations, an estimate of monthly revenue is required.

Keep track of all expenditures used in production by crop. The *type and quantity* of inputs must be recorded. These will be converted into monetary units by the data analysts. If the value of an input is known, make sure it is recorded. If not known, data analysts will research its price. Expenditures might include ploughing services, paid labor, or inputs such as fertilizer,

pesticides, seed, etc. Quantify payments in kind such as a bag of rice for ploughing services. In such cases, identify the field or area ploughed and the type and quantity of payment. Likewise, the wages and food provided to day laborers should be estimated in Guinean francs. These expenditures are needed to establish the net revenue from each agricultural operation. *This information should be noted in the expenses column of the appropriate field module.*

C. The Livestock Module

The initial survey for the livestock module is in April; follow-up survey is in November.

The survey of animal populations is to be carried out twice per year during the months of April and November. The April survey establishes an initial estimate of the situation. The November survey is more accurate and will be carried out at the end of the rainy season when cattle and flocks are grazing close to the community.

Using the livestock module, list the following information:

- The number of units/head by species.
- For apiculture, the number of hives indicating improved or traditional types.
- For aviculture, list the species and number of birds *only for households who sell significant numbers to the market*. Do not bother with small household stock. Ignore households with less than 10 units.

An estimate of income from livestock will be made at the data entry level using data from the Service de l'Élevage and, if needed, other specific studies to determine an off-take value per species. *The chief task of the fieldworker is to acquire accurate data on the number of head per household by species.*

Income from apiculture will be determined by two methods. The first method is to draw from an inventory of bee-hives (both traditional and improved). As with livestock, honey and wax production can be reasonably estimated for each type of hive. The second approach is to interview bee-keepers to determine how much production is actually sold at what price. These estimates of sales and a record of prices are to be noted on the livestock form.

Income from aviculture follows the same logic as for bee-keeping. Where a household has established an enterprise for production of fowl and/or eggs, record the number of units and interview household members to estimate income.

D. Module for Artisanal Production, Wage Labor, and Commerce

The initial survey will take place in February; the follow-up survey in July.

This module is administered soon after the demographic modules have been completed and individuals working as artisans, wage-laborers, or in commerce are known. This module is

designed to record all non-agro-pastoral activities within the watershed area that bring income to the household.

The fieldworkers must identify and record such activities on the module by indicating the number of males and females engaged in each activity.

Two methods will be used to determine net revenue to the household. First, fieldworkers will carry out direct interviews asking producers in the appropriate categories (blacksmiths, weavers, wood-workers, etc.) to estimate their revenue from the activity. Fieldworkers will be trained in open-ended interview techniques that will be used to estimate production and net income from these activities.

Second, existing studies of traditional occupations will be used to establish net revenues per unit of production in areas such as weaving cloth, shoe-making, soap-making, etc.

E. Health Status Module

This module is given twice per year, in the middle of the rainy season (the end of August) and in the middle of the dry season (at the end of March).

A recall period of two weeks is given so that accurate data can be gathered. The purpose of this survey is to take biannual estimates of health status that have a high level of correlation with the quality of water during each primary season.

F. Other Data Collection Tasks

Fieldworkers will collect information needed to assess changes in market efficiency, prices, and rural investment.

F1. Traffic Counts

The survey periods are February, May, August, and November. Individuals will be hired to monitor traffic on selected roads in the watersheds. These individuals will likely be retired civil servants who will record all types of vehicular traffic for a period of seven days (over 24 hours) four times per year. Two people per observation point will be hired to manage daytime and nighttime activity. (The passage of project vehicles is *not* to be recorded.)

Transport Tariffs and Time. The survey periods are February, May, August, and November. Pre- and post-road improvement transport costs and travel times will be determined using the following methods:

- Direct interviews with transporters
- Information from transport unions

Tariffs will be obtained for the transport of goods (price per ton/km) and passengers (per km). Travel times over improved roads will be obtained during the same period. This information

will be gathered quarterly during the same survey periods as traffic counts. Data entry personnel will be designated to collect this information.

F2. Markets and Commodity Prices

The survey periods are February, May, August, and November.

Local Market Prices. The market module will be used to record commodity prices for selected agricultural, pastoral, and other products in watershed markets. Data entry personnel will be programmed to collect this data four times per year.

Urban Market Prices. Urban commodity prices in regional markets (Labé, Tougé, and Kindia) will be recorded by data entry personnel following the same schedule as for local markets.

F3. Credit Data Acquisition

The survey periods are January and July. The M&E statistician will obtain data on loans from lending institutions (Crédit Mutuel, Crédit Rural, the BICIGUI, and the PRIDE project).

G. Data Management and Quality Control

G1. Database Management and Personnel

To minimize costs and optimize project expertise, this monitoring system has opted for a relatively small but representative sample, just over 10 percent of the target population. The use of high-resolution, good quality data will enable extrapolations to the larger watershed population. The central objective of the monitoring and data management team is to obtain clear and accurate images of resource use and economy among the target population.

The fieldworkers used should be local people based in communities in the target watersheds. The data management team could frequently monitor these individuals to ensure data veracity. The fieldworkers' role is to measure and quantify basic information needed for analyses (i.e., the dimensions of fields, the number of livestock, the number of migrants, and the key production characteristics of artisanal and other types of employment).

The role of the data management team is to transform data from the field into accurate measures needed for analysis. At the data management level, the focus is on accurate conversions (yields, off-take rates and income from livestock, income from migrants and other employment). This will necessitate specific or punctual studies in the field which can be facilitated by village-based fieldworkers and by reference to secondary sources and studies.

At least literate fieldworkers will be recruited from communities within the watersheds: one man and one woman. Women fieldworkers will focus chiefly on obtaining demographic data, gathering information on income from women's activities, and measuring health status. Male fieldworkers will gather data on fields, crops, livestock, and other predominantly male occupations.

This approach to data acquisition in the field will benefit monitoring by providing a permanent presence on the ground and exploit local knowledge of community activities. Fieldworkers' of this type are also of great value in specific surveys to determine off-take or income from specific activities.

The M & E core team is composed of the following staff:

- A principal consultant - an economist responsible for system operation, analyses, and reporting.
- A statistician consultant—responsible for preliminary analyses, management of specific studies, and data collection on urban markets and transport.
- A data entry/programmer—responsible for all data entry, assistance with periodic market and other data collection, data bank management, and output preparation.
- A DNFF analyst trainee working on all aspects of monitoring.

This core team will be assisted by:

- Six watershed fieldworkers
- Temporary employees hired to gather specific data (transport surveys) in the watersheds
- Technical assistance technicians reporting on progress indicators for interventions

The principal consultant will report monthly (on establishing an agreed upon schedule) to the Chemonics chief of party. Meetings with technical assistance team members and DNFF to discuss M&E issues will be scheduled at the discretion of the COP.

G2. Training

Both the core data management team and the fieldworkers will receive training.

Training of the core data management team was undertaken in close collaboration with the principal consultant (Management Consultants, S.A.R.L.). The database structure and analytical configuration were developed with the assistance of all core team members, including active input and participation on the part of the DNFF analyst-trainee. The principal consultant will remain with the project to ensure technical assistance as needed over the life of project.

Identification of watershed fieldworkers was undertaken by the core team and the M&E consultant from Chemonics. Training of watershed fieldworkers will be undertaken by the core team, who is familiar with the design and purpose of the surveys. Fieldworkers must know *why* they are collecting data. During the training, each module was introduced and explained to people interviewed. Their level of understanding of how and why the modules are used was a central factor in evaluating fieldworker candidates. The data collection modules will be initially

administered in sample households in the presence of core team members until the fieldworker proves capable of performing on his or her own.

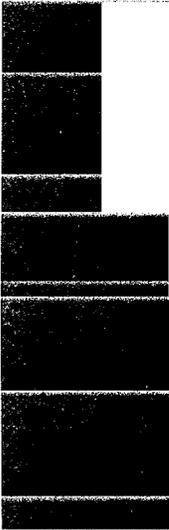
G3. Logistical Support

The project will supply vehicle transport to and from the watersheds for core data management team. Motorcycles and fuel will be made available for movement within the watersheds.

H. A Sample Time Schedule for Monitoring Activities

A sample time schedule for December 1995 to December 1996 for Management Consultants, S.A.R.L., is shown on the next page.

A time schedule outlining the tracking and monitoring to be undertaken by the technical assistance team and counterparts will be developed in the annual work plan (December 1995).



ANNEX A
SCOPE OF WORK



ANNEX A
SCOPE OF WORK FOR A RURAL SOCIOLOGIST OR SOCIAL SCIENTIST
TO MONITOR PROJECT IMPACT ON COMMUNITY-BASED NRM

A. Background

The Guinea Natural Resources Management (NRM) Project operates in three watersheds in the Fouta Djallon Highlands of Middle Guinea. The goal of the GNRM project is “to increase sustainable agriculture and value-added production by men and women for domestic and export markets.” Its purpose is “to improve the management of natural resources of profitable and sustainable agricultural production in three watersheds of the Fouta Djallon Highlands.”

The project includes six separate components—natural resource management, enterprise development, applied research, training, policy analysis and impact monitoring and evaluation. Although project activities started in January 1993, the monitoring and evaluation program did not get under way until October 1993. At that time, a short-term consultant arrived to suggest monitoring and evaluation indicators and provide preliminary guidelines for the establishment of a monitoring and evaluation system (see Guyton, 1993, “Guidelines to Establish and Maintain a Monitoring and Evaluation System for the USAID and DNFC Guinea NRM Project”). Based on the consultant’s recommendations and project personnel constraints, the impact monitoring and evaluation (M&E) component of the project was subcontracted to Management Consultants, a Guinean firm located in Conakry. The contract was finalized in July 1994. A monitoring and evaluation plan was developed by the subcontractor, in collaboration with USAID and DNFF personnel and the Chemonics Chief of Party (see I. Samba, F. Kalo, K.B. Paul, and Traore, 1994; GNRM No. 675-0219 Monitoring and Evaluation Plan). This document describes the objectives of the monitoring and evaluation plan and describes its relation to the NRM analytical framework.

Although a significant amount of biophysical impact and progress monitoring data is collected by watershed personnel, Management Consultants has primary responsibility for collecting and verifying the reliability of all baseline, secondary, and socioeconomic data. To facilitate this work, a socioeconomic survey was designed by the subcontractor and tested in the fall of 1994. A draft baseline survey was presented in January 1995, which incorporated most of the information collected in the socioeconomic survey. Unfortunately, this report did not contain all the information specified in the M&E plan and requires significant revision. Moreover, a mid-term evaluation of the project severely criticized the methodology used in the socioeconomic survey, and the survey instrument itself. As a result of the mid-term evaluation and problems with the original draft of the baseline study, the project is requesting the assistance of a social scientist/rural sociologist to assist in the creation of a new socioeconomic survey, which will permit the subcontractor to collect reliable and valid baseline and monitoring data.

B. Justification, Objective, and Outputs

The project lacks a social scientist to assist in the development of our socioeconomic survey. This survey is required to ensure accurate and valid monitoring of the people level impacts of project activities. Similarly, there is little of this expertise on the teams of the Guinean watershed management units (WMU), or within subcontractor (Management Consultants) personnel. Moreover, lack of input from a qualified sociologist to the monitoring and evaluation plan was severely criticized by a recent mid-term evaluation team. Because of the methods used to collect the socioeconomic baseline data, the usefulness of the data provided from the socioeconomic survey was questioned. Thus, the project is seeking a social scientist/rural sociologist to redesign the socioeconomic survey, establish an appropriate survey methodology, recommend appropriate data analysis, and train watershed technician and subcontractor personnel in sound survey methodologies.

The project intends to provide three outputs from this consultancy:

- A compilation of existing socioeconomic data relevant to the three target watersheds.
- A sound socioeconomic survey that can be used to evaluate the people-level impacts of Guinea NRM activities, as well as serve as a model for use by other NRM projects in the area.
- A training program to ensure adequate interviewing skills on the part of the subcontractor, Management Consultants, and on the part of watershed personnel. This training program can be used by DNFF to replicate data collection procedures in other watersheds and facilitate the collection of comparable and statistically valid data.

During the assignment, the consultant will collaborate closely with the entire Guinea NRM project staff, but especially with Management Consultants personnel (data analyst, surveyors, and Mr. Traoré), the soil and water conservation/crop production technical assistant, the GNRM chief of party, and PMU regional coordinator, the PMU data analyst, the watershed directors, and six designated watershed technicians (Promotion Feminine el Développement des Entreprises).

C. Scope of Work

The consultant in socioeconomic survey design will:

- 1) Review pertinent literature and project documents, including original baseline data collected by the RAF project, and especially those reports that pertain to socioeconomic data and describe people-level impacts (including GNRM Participatory and Rural Appraisals; see also K. Baird, S. Kelleher, and P. Williams, 1990; Sociocultural, Economic, and Natural Resources Assessment of the Koundou and Diafore Watersheds, Fouta Djallon, Intercooperação e Desenvolvimento (INDE), 1992; Etude Socioeconomic

dans la zone d'intervention du PRAFD). Prepare a compilation of useful socioeconomic baseline or "pre-project" data.

2) Review USAID Monitoring and Evaluation guidelines, the guidelines developed in the Guyton report, and the Guinea NRM Monitoring and Evaluation Plan, in conjunction with the mid-term evaluation recommendations.

3) Describe the information which would be useful for sound socioeconomic impact and progress monitoring.

4) Review the existing revised sample frame and revise if necessary.

5) Review preliminary data and analysis in the draft report and offer constructive criticism and revisions.

6) Review and revise the existing socioeconomic survey questionnaire and methodology.

7) Develop and conduct a training program for Management Consultants personnel (data analyst, surveyors, and Mr. Traoré). Promotion Feminine and enterprise development watershed technicians, PMU data analyst, and watershed directors on survey and interview methodology.

8) Supervise the test phase of the 1995 socioeconomic survey.

9) Provide recommendations on final data structure, analysis, and interpretation.

10) Make recommendations concerning how this data could be used by the Guinea NRM project and by the GOG, and how it could be useful for villagers.

11) Suggest future survey training or technical assistance needs.

12) Prepare a bibliography of pertinent available documents describing socioeconomic survey methods and sources of secondary information to be used in conjunction with our socioeconomic survey. Provide copies of the most useful socioeconomic survey information.

D. Qualifications

The selected candidate should have about five years of experience in Africa conducting related surveys and analyzing data. Work with grass-roots development programs is essential. An advanced degree in anthropology, sociology, or a related field as well as fluency in French is also required. Strong qualifications in survey methodology and statistical analysis are necessary. Experience with impact monitoring highly desirable. Capability in Pular and/or Sasu is highly desirable.

E. Reports

Before leaving Guinea, the consultant will submit a draft report to the Project Management Unit (PMU), DNFF, and USIA/Conakry. Among other elements, the report will contain a summary of the compiled socioeconomic data (from secondary sources), a final copy of the socioeconomic survey, a description of the socioeconomic survey training program, a training outline, a description of the analyses which should be included in the socioeconomic portion of the monitoring and evaluation report, recommendations for future socioeconomic training needs, the requested bibliography and photocopy, and any additional revisions proposed in the socioeconomic portion of the monitoring and evaluation program. The consultant will also conduct a debriefing for USAID/Conakry, MAEF, and DNFF, presenting the major results and conclusion of the consultancy before her/his departure. A final report, incorporating PMU, USAID/Conakry, and DNFF/MAEF comments, will be submitted to Chemonics no later than one month after the consultant receives the draft report of the socioeconomic survey.

F. Period of Contract and Proposed Itinerary

The duration of the assignment will be approximately seven weeks. The consultant will spend one working day in the Chemonics home office at the start of the assignment (if stateside), approximately three working days in Conakry (at the start and end of the assignment), and the rest of the time in the field (Labé and project watersheds). The period from October 1995 to December 1995 has been reserved for this consultancy. This time reservation has been made to minimize interference with other training programs, and to coincide with the annual harvest season. A proposed itinerary for the field work follows:

- Week 1 Before departure, review relevant project documents (3 days). Discuss assignment and opinions on relevant issues with USAID/Conakry personnel (.5 day), visit and meet with the MAEF/DNFF monitoring and evaluation team and Management Consultants personnel in Conakry (.5 day). Travel to Labé (1 day). Meet with watershed personnel in Dissa to assess their technical strengths and weaknesses (during transport to Labé). Meet with Haute-Gambie, FAO, and FIDA personnel to discuss their socioeconomic survey methods and findings (discuss the possibility of including their personnel in training) (.5 day).
- Week 2 Locate and review existing socioeconomic data from Baird et al., INDE, PRAFD, RAF, etc. Summarize secondary socioeconomic data relevant to Guinea NRM M&E program.
- Week 3 Review the existing sample frame, and determine the information required for sound socioeconomic impact and progress monitoring (2 days). Consult with WMU technician and directors in Labé to determine how to collect the type of information desired (2 days). Based on this consultation, develop the survey methodology, describe the analyses required, and design the socioeconomic survey (3 days).

- Week 4 Develop and organize the training program (3 to 5 days). Implement the training program in Labé (2 to 3 days).
- Week 5-6 Begin field tests of the new socioeconomic survey. Oversee use of the instrument by trained personnel. Make preliminary corrections. (8 to 10 days).
- Week 7 Based on field tests, revise the survey (1 to 2 days). Provide a day of follow-up training to the survey team (1 day). Revise sections of the draft baseline report and reanalyze the data based on changes recommended during the consultancy (1 to 2 days). Review and revise preliminary report and analyses made by Management Consultants (1 to 2 days).

G. Logistical Support

The PMU in Labé will be responsible for providing all logistical support to the consultant while (s)he is in country, including accommodation, transportation, and making the initial contacts/appointments. The project may need to provide translators or temporary local assistants to facilitate certain phases of the work. The consultant must bring his/her own laptop computer; the printer and the photocopy machine at the PMU/Labé will be made available. A six-day work week may be requested.

ANNEX B

BUDGET FOR MONITORING AND EVALUATION SERVICES

**Annex B: Subcontractor, Management Consultants, S.A.R.L.
Budget for M&E Services from 12/95 to 12/96 (13 months)**

Budget Category	PM or Units/Yr	Rate \$US	Total Year 1
1. Salaries and Wages			
A. Salaries, Long-term			
Database manager/analysis	13	750	9,750
Database manager/Input	13	368	4,784
Fieldworkers (2 x 3 watersheds = 6)	72	125	9,000
B. Salaries, Short-term			
Field technicians transport surveys (3)	3	200	600
C. Salaries, Home-office			
Principal consultant (Traoré)	8	2000	16,000
Subtotal: Salaries			40,134
2. Overhead			
A. Long-term professional	23,534	35%	8,237
B. Short-term professional	600	35%	210
C. Home office	12,000	35%	4,200
Subtotal: Overhead			12,647
3. Travel and transportation			
A. In-country travel	13	100	1,300
Subtotal: Travel and Transportation			1,300
4. Allowances			
A. Per diem			
Database manager/analysis	150	20	3,000
Database manager/input	150	20	3,000
DNFF trainee	(150)		
Principal consultant (Traoré)	210	20	4,200
B. Living quarters allowance			
Database manager/analysis	13	120	1,560
Data manager/input	13	120	1,560
Hotel accommodation, prin. consultant	210	20	4,200
Subtotal: Allowances			17,520
5. Other Direct Costs			
A. Communication	13	30	390
B. Reproduction & translation	13	150	1,950
C. Expendable supplies	13	50	650
D. Bank charges	13	20	260
E. Moto maint., fuel	13	125	1,625
Subtotal: ODC			4,875
Subtotal			76,476
7. Fixed Fee 5 Percent	68,276	5%	3,414
Grand Total			79,890