

DESFIL

Development Strategies for Fragile Lands

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**RURAL HOUSEHOLDS' KNOWLEDGE AND USE OF
NATURAL RESOURCE MANAGEMENT PRACTICES:
A Pilot Survey in the Tillaberi, Tahoua, and Maradi Departments of Niger**

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ACRONYMS

ASDG II	Agricultural Sector Development Grant Project, Phase II, USAID/Niger
ASF	Area Sample Frame
CILSS	Committee for Drought Control in the Sahel
CGTV	Management Committee for Village Territory (Comité de Gestion de Terroir Villageois)
C/GRN	Unit for the Management of Natural Resources
CLUSA	Cooperative League of the U.S.A.
DHS	Demographic and Health Survey, by Macro International
DSCN	Department of Statistics and National Accounts
EDF	European Development Fund
FAO	U.N. Food and Agricultural Organization
FNUAP	U.N. Population Program
GON	Government of Niger
GTZ-PASPII	German Cooperation Agency, Agro-Sylvo-Pastoral Project, Phase II
IFAD-PSN	International Fund for Agricultural Development, Special National Project
M&E	Monitoring and evaluation
MAG/EL	Ministry of Agriculture and Animal Husbandry
NBS	National Baseline Survey of 1996, USAID/Niger
NGO	Non-governmental organization
NRM	Natural resource management
NRMA	Natural resource management and agriculture unit of USAID/Niger
PDRAA	Rural Development Project of Aguiye Arrondissement PGTF Village Management Project of Filingue
PMP	Program monitoring and performance (indicators)
PN/GRN	National Program for the Management of Natural Resources
PTS	Pre-Test Survey of 1995, USAID/Niger
SAS	Statistical Analysis System (software for data analysis)
S.O.	Strategic Objective
S.O.3	Strategic Objective Three, USAID/Niger
SOW	Scope of work
SPSS	Statistical Package for the Social Sciences (software for data analysis)
TA	Technical Assistance
TOR	Terms of Reference
U.S.A.	United States of America
USAID	United States Agency for International Development
UNDP	United Nations Development Program
UNEF	United Nations Environmental Fund
WOOCU	World Organization of Credit Unions

EXECUTIVE SUMMARY

The 1995 Pre-Test Survey of Natural Resource Management practices in rural Niger was designed and implemented as a pre-test of each phase of the Niger Mission's national-level baseline survey scheduled for 1996. Its major objective therefore was to test the Mission's NRM indicators as well as the sampling strategy, questionnaires, and the GON's institutional support capacity for the national survey. The secondary objectives were to field-test the survey questionnaires extensively in three different agricultural systems and to generate information about the NRM techniques that rural men and women currently use, in order to give the Mission pre-baseline data on the status of its NRM indicators. This report is the final product of the PTS and provides, based on the field work and data analysis, technical recommendations for the 1996 national survey. The report also analyzes the survey data in terms of the Mission's NRM indicators, and more broadly, in order to describe rural Nigeriens and the NRM technology that they use.

The PTS shows that rural Nigeriens conceptualize and manage their natural resources mainly in terms of producing agricultural products and livestock. These people do not conceptually separate "NRM" from "agriculture;" rather, agriculture is their major form of NRM. Future NRM surveys and questionnaires therefore should be oriented toward how people manage their private natural resources--namely their agricultural fields, as the focus for how they manage other natural resources--as well as how they manage their communal natural resources such as water, trees, pasture, and the bush.

The PTS also shows that some of the Mission's NRM indicators should be revised or replaced in order to collect more accurate data about changes over time in people's use and knowledge of NRM technology. We recommend assessing changes in people's use of NRM technology by comparing the lists of NRM techniques produced by the 1996 baseline survey with the lists produced by follow-up surveys. The differences between these lists will show which techniques are "new" in each time period. We also recommend assessing change by comparing the shifts over time in the percentages of people that are using all the different NRM techniques. Information about the modern NRM technology that people know about but do not use should be collected by using a list of 20 or fewer modern techniques, in order to improve the focus on this topic and reduce the time required for interviewing. A village-based sampling strategy is recommended for the 1996 national survey. The sample should be a random sample of Niger's rural villages, stratified into villages with and without NRM projects.

The Pre-Test surveyed the male and female heads of 135 concessions in eighteen villages. Half of the villages were working with NRM projects and half were not. The survey was conducted in three different geographical areas and agricultural production systems (Tillaberi, Tahoua, and Maradi). The survey data show that rural men and women use and know about a wide range of NRM techniques to manage their agricultural and livestock production. The 135 concessions surveyed reported that they currently use a total of 90 different NRM techniques and that they know about but do not use the same number of techniques. There are differences between men and women, and between project and non-project villages, in the use and knowledge of NRM technology.

SECTION I INTRODUCTION

A. The Background of the 1995 Pre-Test Survey

The GON has a National Program for Natural Resource Management (PN/GRN) and donors are investing approximately half a million dollars in NRM in Niger, but monitoring and evaluation activities and information about NRM at the national level does not yet exist. Individual donors collect a range of regional- and farmer-level NRM data, but they are not aggregable to the national level due to different M&E objectives and the use of different methodologies. Thus AID/Niger, like the GON and all donors, has limited knowledge of the types and distribution of NRM technology throughout Niger. This lack of information is critical. AID/Niger needs national-level information to evaluate the results of its policy reform activity (the Agricultural Sector Development Grant, Phase II) and to link its program with the PN/GRN. AID/Niger's S.O.3 Pre-Test Survey (PTS) therefore was designed as the first step in addressing this critical information gap, by testing the methodology for a national survey of NRM in 1996. The Pre-Test Survey also was a major step toward coordinating research with the PN/GRN and toward making national-level information about NRM available in Niger. The data from both the 1995 Pre-Test Survey and the 1996 national survey will be essential to AID/Niger and will contribute to the PN/GRN's overall knowledge of NRM and the impact of NRM projects. Both surveys will be conducted in collaboration with the PN/GRN, so that the research process and the data forge links between AID/Niger's program and that of the PN/GRN.

B. The 1995 Pre-Test Survey Objectives

The NRMA Unit of AID/Niger commissioned the 1995 Pre-Test NRM Survey as a pilot exercise for the larger, national-level baseline NRM survey scheduled for 1996. The 1995 Pre-Test Survey was designed and implemented as a pre-test for every phase of the 1996 National Baseline Survey (NBS), beginning with the sample and questionnaire design, and concluding with the data input and analysis on which this preliminary report on S.O.3's PMP indicators is based. Evaluating the technical and support capacity of the GON institutions (the Department of Statistics and National Accounts, DSCN; the National NRM Program Unit, C/GRN) that are S.O.3's collaborators for both the 1995 and 1996 surveys was another principal objective of the PTS. This report is the final product of the PTS and includes technical recommendations for the 1996 survey based on the pre-test, general and detailed analyses of the survey data, and copies of the final questionnaires used in 1995.

The PTS had two secondary objectives. The first was to conduct an extensive field-test of the survey questionnaire in different agricultural systems, in order to have a questionnaire ready for the 1996 survey. The second was to produce a working list of the NRM techniques used and known by rural households, and other pre-baseline information, to give S.O.3 a preliminary view of the status of its PMP indicators in rural Niger.

C. Organization of the Report

This report consists of five chapters and five annexes. Chapter II is a detailed explanation of the survey methodology, including the questionnaire design, sampling strategy, and the three agricultural systems surveyed. The major methodological conclusions and recommendations for the 1996 National Baseline Survey, based on the Pre-Test Survey and its data, are presented in

Chapter III. Additional technical and logistical recommendations for the 1996 survey comprise Chapter IV. Chapter V uses the survey data to report on the status of the S.O.3 indicators, and other key topics such as access to credit, in 1995.

Rural households' socioeconomic characteristics, use of NRM technology, and knowledge of NRM technology are reviewed in Annex A. This data review highlights the differences between households in project and non-project villages, and between men and women. The survey data are summarized in the tables in Annex B. The pre-coded master list of NRM practices in French, Haussa, and Zarma used in the survey is in Annex C. The enumerators' manual and list of key terms is in Annex D, and the English versions of the three questionnaires used in the Pre-Test Survey are in Annex E.

SECTION II THE SURVEY METHODOLOGY

A. The Technical Team

The core technical team for the 1995 Pre-Test Survey consisted of four people: Dr. Elizabeth Adelski, an anthropologist, who was the team leader; Mr. Allachi Boukar, a sociologist from MAG/EL's evaluation unit, who was Dr. Adelski's homologue; Mr. Ibrahim Salifou, an agronomist from the Direction of Agriculture, who had worked with the GTZ-PASP during the past four years; Mr. John Lichte, an agricultural economist, who supervised the survey in the field; and Mr. Mahamane Abdourazak, a computer expert from DSCN, who supervised the data input process. Mr. Allachi Boukar and Mr. Ibrahim Salifou worked on every phase of the survey and served as Team Leaders in the field. Mr. Lichte supervised the survey fieldwork and the data input.

The Department of Statistics and National Accounts (DSCN) and the GON's NRM Unit were the major providers of the institutional support and resources necessary for the survey. DSCN provided the technical expertise, personnel, and computers to input the survey data. The GON's NRM Unit provided logistical support in the form of a car and driver for the duration of the survey. The technical team also worked with the S.O.3 team and its partners to design the survey questionnaire and sample.

B. Questionnaire Design and Field-Testing

Designing the survey questionnaire was focused on S.O.3's information needs about program impact, in the form of its PMP indicators. The PMP indicators were transformed into the core questions of the questionnaire. Questions about the rural population's socioeconomic characteristics and their access to credit comprised the rest of the questionnaire.

The PMP indicators that S.O.3 will measure every four years with national surveys are:

1. Percent of heads of households, both men and women, reporting the use of one or more new NRM technologies.
2. Percent of heads of households, both men and women, aware of the Rural Code.
3. Percent of heads of households, both men and women, able to identify at least one new NRM method.
4. Percent of heads of households, both men and women, able to describe at least one NRM practice used in another village.
5. Percent of heads of households, both men and women, with access to market and climatic reporting services.
6. Percent of heads of households, both men and women, reporting access to credit.

Three questionnaires were designed, in order to collect information from men, women, and village-level groups. Having separate questionnaires for men and women generated identical sets

of gender-specific information about NRM; matching up each concession's male and female questionnaires produced concession-level information. The village-level questionnaire was administered publicly to the village chief, elders, and other villagers who chose to attend. It collected information about village infrastructure and the management of communal natural resources. The questionnaires were almost entirely precoded in order to facilitate data collection and input from large survey samples. The questionnaires are in Annex V. The questionnaires and the manual written as a guide to them for the enumerators were written in French; the latter included a glossary of key terms that were translated into Hausa and Zarma (Annex IV). Hausa, Zarma, Peulh, and Touareg villages were surveyed, but all the respondents spoke Hausa or Zarma.

The technical team drafted the questionnaires, submitted them to the S.O.3 team and its M&E team, and then met to discuss the revisions that were indicated. The process of field-testing the questionnaires in different sites also indicated revisions. The questionnaires were finalized based on the S.O.3 team's comments and, before the actual survey, field-testing in fourteen different villages, as Table II-1 below shows. The field-testing was done during September-October 1995.

Table II-1. Sites of Field-Testing for the Survey Questionnaire

Arrondissement	Village	Agricultural System	Project or Non-Project
1. Kollo	Hamdalaye	Dune fields.	No project.
2. Filingue	Dorobobo	Dune fields.	PGTF project, 3 years.
3. Filingue	Nagizi	Dune fields plus the dallols.	PGTF project, 1 year.
4. Kollo	Banigungu	Irrigated perimeters along the Niger river, plus dune fields.	Technical assistance from the GON.
5. Madarounfa	Djiratawa	Dune fields and the goulbis; irrigated perimeters using modern irrigation technology (motorized pumps).	Former World Bank project; run by cooperatives since 1987.
6. Madarounfa	Garin Bori Doki	Dune fields.	No project.
7. Madarounfa	Sarkui Rima	Goulbis plus dune fields; irrigation using traditional, manual technology	No project.
8. Mayayi	Janroua	Dune fields.	Projet Mayayi, UNEF-UNDP-FAO, since 1995.
9. Madarounfa	Baguega	Dune fields, plus exploitation of Baban Rafi forest.	Project CARE-Salama.
10. Dosso	Maidahini, Hamka-Tombo, Serkin Dalikora	Dune fields.	PDAAT: Projet d'Appui Aménagement de Terroir.
11. Dosso	Nakinfada, Tounga	Dune fields.	No project.

C. Training the Enumerators

A group of men and women candidates were interviewed, tested, and hired as trainees. All were fluent in French, Hausa, and Zarma. They participated in one week of classroom training, after which five were chosen as enumerators for the PTS, two men and three women. These five were given two additional weeks of field-training in the PTS field methodology and questionnaire administration. One week of field-training was done in villages outside Niamey and another week was done in the Dosso area. Both of the men had educational backgrounds and work experience in agriculture/NRM; none of the women did, which affected their work (see Section IV).

D. The Sampling Strategy

D1. The Survey Sample

The types and distribution of NRM techniques used by rural Nigeriens is not well documented in Niger, particularly at the regional and national levels. We assumed that rural households' use of NRM technology was a relatively rare variable and associated with operational NRM projects. In order to ensure that the small-scale PTS sample would include NRM users, two strata were defined: 1) villages that currently were working with NRM projects and 2) villages that were not. Three different geographical areas and agricultural production systems were purposively chosen to be surveyed, in order to test the questionnaire in different contexts and to generate data that would provide some insight into the differential distribution of NRM technology. For these reasons it also was decided to survey one pastoralist village (Peulh or Touareg) in each zone. The different geographical areas, agricultural systems, and projects surveyed are summarized in Table 2 below. The survey sample thus was designed to: 1) include NRM users; 2) include variation in economic systems; and 3) be possible to survey within the one month allocated for fieldwork by the SOW.

The PTS sample is summarized in Table II-2 below. A total of 135 concessions in 18 villages were surveyed; this produced 135 questionnaires from concession heads, 134 from women, and 18 from villages groups. Nine villages working with NRM projects and nine villages without NRM projects were surveyed; 66 concessions in project villages and 69 concessions in non-project villages were surveyed.

The unit of sampling and analysis for the PTS was the concession, which we defined as the group of people who work their collective fields together and eat from the same granary. The concession generally is an extended household consisting of a man and his wife/wives, their children, and often other relatives such as a widowed sister, parents, or unmarried siblings. The terms "concession" and "household" therefore are interchangeable in this report. A concession was identified by its head, the "*chef de concession*," usually but not always a male, who had authority over the household resources, including the use of its fields and other resources for agricultural production and NRM. The survey methodology was designed to interview the *chef de concession* and his first wife in each concession. We estimate that approximately 95% of the men interviewed were the male concession heads and approximately 90% of the women interviewed were their first wives. The rest of the men and women surveyed were appropriate substitutes for these people, in the few cases when the *chefs de concession* or their first wives were inappropriate to interview due to factors such as inactivity or absence.

The survey thus produced 135 *chef de concession* questionnaires (including only one woman), 134 women's questionnaires, and 18 questionnaires from village groups. The size of the survey sample was determined by the time period of one month allocated to conduct the survey. It is important to note that the primary objective of the PTS was to test the survey methodology on a small scale; its secondary objective was to generate all the data possible in this limited time. The survey team was able to survey one village per day and six to nine concessions per village.

The S.O.3 team purposively chose three NRM projects for the survey. They were the IFAD-Special National Project in Tillaberi, the European Development Fund-Basse Vallee Tarka in Tahoua, and the Sudan Interior Mission-Maradi Tree Project in Maradi (Table 2.) The *arrondissements* where the survey was conducted were chosen randomly from the *arrondissements* where the projects were operating. The project villages to be surveyed were

chosen purposively by the local project personnel who identified the more successful project villages (to capture NRM users). The project personnel also identified nearby non-project villages that were socially and economically similar for the survey.

In Tillaberi and Tahoua, the village chiefs' lists of tax-paying households constituted the list frames for choosing random samples of households for the survey. These lists were not available in Maradi and three of the pastoralist villages, so the sampling was not random in those areas. In those areas the village chief was asked to identify representative ("average") households to be interviewed.

D2. The NRM Projects Surveyed: A Brief Summary

The IFAD-PSN-Tillaberi project's main activity is promoting dry-season vegetable production in irrigated perimeters by providing credit. The vegetable production is limited mainly to the dry season because the perimeters are used for rice production during the rainy season. The project supports 12 collective perimeters, four of which are for women only, and several hundred individual farmers who use motor pumps. Credit is used primarily to purchase motor pumps and fertilizer; a revolving credit fund is used to purchase seed and fertilizer. IFAD has promoted wind breaks and live fencing. It also has provided training in functional literacy and numeracy, and in the skills necessary to establish local management committees for the revolving credit funds.

The EDF-Basse Vallée de la Tarka-Tahoua project's main focus is to provide tube wells and small motor pumps for irrigated vegetable production, primarily onions. The project has placed about 1,800 tube wells in the valley and has requests for another 800. The project operates by helping to establish village-level credit management committees. Credit is provided for: agricultural inputs, animal traction, livestock fattening, post-harvest processing of agricultural products, weaving mats, and honey and poultry production. Individual loans are given for grain mills, tube wells, and motor pumps.

Treating large areas with physical soil and water conservation structures, using a mini-watershed approach and Food-for-Work is the project's second major focus. The primary intervention on the steep slopes between the plateau and the valley is contour rock walls (*murets*). Demi-lunes and *banquettes* are among the techniques commonly used on the plateau and in the valley. They are used to reclaim degraded land and to increase productivity in the valley. The project treated 3,000 hectares in 1994 and plans to treat 6,000 in 1995.

The SIM Tree Project in Maradi developed out of SIM's participation in drought relief. Food-for-Work was used to plant trees and protect natural regeneration in farmers' fields. Over the course of fifteen years and several droughts, the number of participants in these NRM activities has grown. About 180 villages have participated in the SIM project at different times. The degree of participation varies greatly by village and by household within participating villages. The project's primary objective has been to protect naturally regenerating trees in farmers' fields; its secondary objective has been to promote planting multi-purpose trees around concessions, in fields, and as wind breaks. The trees used include the baobab, neem, other local acacias, and the doum palm. The SIM technicians provide extension advice for agricultural production and for the conservation of trees, soil, and water.

**Table II-2. The 1995 Pre-Test Survey Sample
(HHs = number of households surveyed)**

	I. Tillaberi Irrigated perimeters and dune fields. IFAD-PSN Project	II. Tahoua Plateau and decrue fields. FED-Basse Vallée de Tarka Project	III. Maradi Dune fields. Sudan Interior Mission- Maradi Tree Project
Department	Tillaberi	Tahoua	Maradi
Arrondissement	Tillaberi	Bouza	Madarounfa
Cantons	Tillakaina Sinder Kourtey	Bouza	Djiratawa Madarounfa
Project villages	Sakoira 6 HHs Goure Bio 6 HHs Sansoni 6 HHs	Kougouptche 6 HHs Fadara 6 HHs Kajiki 9 HHs	Goulabawa 9 HHs Barafia 9 HHs Dajin Biri 9 HHs
Non-project villages	N'Bida 9 HHs Darbani 6 HHs	Babaranga 9 HHs Zongo Marafa 6 HHs Abalo 6 HHs	Doullou 9 HHs Guidan Basso 9 HHs
Pastoralist village	Tamtala 6 HHs	Zongo Marafa 6 HHs (project village)	Maidoungou 9 HHs

Survey sample totals:

135 household heads, 134 women, 18 villages.

Nine villages with NRM projects and 9 villages without NRM projects.

Sixty-six households in project villages and 69 households in non-project villages.

Tillaberi: 39 households surveyed (38 women)

Tahoua: 42 households surveyed.

Maradi: 54 households surveyed.

E. The Survey Data: Input, Analysis, and Limitations

The process of designing the data input formats, the data dictionaries, and inputting the survey data was done by DSCN personnel. DSCN provided a supervisor for this process who worked with us to create the data input formats, supervise the data inputters, and to correct the databases when the input was completed. DSCN also identified two data inputters, who were given a day of training about the survey questionnaires and the input process. The data were input using IMPS, a software used by the U.S. census bureau, that can create ASCII files. The ASCII files then were transferred into Ariel+, the software DSCN uses for analyzing large databases. However, SAS was used for the final data analysis because it was done in the U.S.A., where Ariel+ is not readily available.

It must be noted that, as with all one-time surveys, the survey data are self-reported, unverified data. We present the data as such and recognize the limitations on accuracy that such

survey data generally have. The percentages and quantitative data generated by the PTS should be used carefully for policy and programming activities. In general, we feel that the interviewees probably under-reported their knowledge of NRM technology, and to a lesser extent their use of it, so that the data are a conservative representation of those two variables. Under-reporting is likely to be the major bias in the survey data.

SECTION III SUMMARY AND CONCLUSIONS

A. Agriculture as a System of Natural Resource Management

The fieldwork done during the Pre-Test Survey indicates that rural men and women conceptualize agricultural production as one broad system of natural resource management, and agro-pastoralism as another. Farmers evidently view agriculture as one principal way of managing their diverse natural resources (land, trees, water, the bush), and agropastoralists view agro-livestock production as another broad system for managing natural resources. The PTS's exploration of how people manage their "wild" resources such as forests and the bush was limited in order to keep the survey interviews to an acceptable length. Village groups generally reported that wild resources, by definition, are "wild" and communal property, and therefore are not managed. This is a topic that remains to be investigated, as in fact people do manage the bush to some extent. We found that rural producers (meaning both men and women) evidently conceptualize agricultural and agro-pastoral production as subsets of natural resource management, not the reverse (NRM as a subset of agriculture), as we generally do. Our conclusion about rural people's conceptual orientation is a preliminary one, a working hypothesis based on our field work done during the course of designing and conducting the PTS.

The practical point, for designing survey questionnaires and for S.O.3's future field research activities, is that it will be more useful to focus on people's agricultural and/or livestock production systems in order to investigate their knowledge and use of NRM, rather than focusing on their natural resource management and conceptualizing it as a subset of their production systems. We believe that this hypothesis bears consideration in interpreting the data and in designing S.O.3's future M&E activities. The PTS questionnaires separated natural resources into four major categories (agricultural fields, trees, water and pasture land) and the survey questioned people about their use and knowledge of NRM technology in each category. As a result of our field experiences, we conclude that this conceptual and practical orientation should be changed. The household questionnaires should address people's production systems as the focal point for asking them about their management of natural resources. The practical results of our field experiences, including our working hypothesis about how rural people conceptualize NRM, are discussed further and applied to revising the survey questionnaires below.

B. The Potential for Secondary Statistical Analysis

The 1995 Pre-Test Survey produced three separate and related databases: one of men, one of women, and one of villages. These databases have great potential for statistical analysis that could increase the S.O.3 team's understanding of NRM-related behavior. The analysis done for this report are descriptive statistics and tabulations, due to constraints of time. These descriptive statistics indicate that there may be relationships between key variables, such as between gender and the use of NRM technology or between residence in project villages and the use of NRM technology, that could be determined with statistical tests. Key variables and the relationships between them also could be explored in terms of the different populations of interest in the survey sample: men, women, and households; project and non-project men, women, and households; agriculturalists or agropastoralists; and the three different agricultural systems surveyed. The PTS databases thus provide the basis for increased understanding of the socioeconomic and agricultural characteristics of the people who use or do not use NRM. Statistical analyses would provide more information for S.O.3 and also identify the topics that

require focused studies. This information would provide insight into people's NRM-related behavior, which is the basis for designing appropriate NRM programs and field activities.

C. The Housing and Use of the 1996 Survey Data

A large, national-level dataset about people's knowledge and use of NRM technology should contribute to the PN/GRN's monitoring program and to other donors' information. We suggest housing one set of the data (on diskette) with the C/GRN and another set with USAID/Niger. The data would be available for analysis to interested agencies, with USAID's approval. This would promote sharing analyses and information among the PN/GRN partners.

The 1995 PTS produced complete sets of data on men, women, households, and villages. These constitute a rich database for secondary statistical analysis that time did not permit for this report. The 1996 NBS will produce a larger and more representative database with greater potential for analysis. S.O.3's partners should have access to this database in order to conduct analyses and generate information that are useful for their programs. USAID/Niger will benefit from the information produced by these outside analyses.

D. Defining NRM Techniques and New NRM Techniques

Due mainly to the lack of information about the types of NRM techniques currently used in rural Niger, and their distribution, the S.O.3 team and the consultants decided to use the grounded approach to collecting that information with the PTS. That is, we designed the survey to collect data about any and all the NRM techniques that rural producers currently use and know about, rather than limiting the data collection to a pre-determined list of techniques that, without adequate information, we hypothesized might be wide-spread or new. The PTS therefore was designed to produce working (pre-baseline) inventories of the NRM techniques known and used, and the frequencies of users/knowers, as the basis for identifying "new" and "wide-spread" and other categories of techniques. This grounded approach was useful in identifying problems with the S.O.3 terminology and the survey methodology; the recommendations below address these problems.

The PTS data show that rural Nigeriens' definitions of NRM techniques do not necessarily match S.O.3's. For example, both men and women reported filtering water, doing agricultural operations on time, manual labor, and collecting fodder from the bush for their livestock as natural resource management. Their conceptualization, as stated above, evidently is that these are some of the diverse means of managing their natural resources to meet household consumption and production needs. Such "techniques" were not originally anticipated in our pre-coded survey questionnaires and certainly broadened our original list. It is broadly true that these are techniques for managing natural resources, but whether or not S.O.3 accepts them as "NRM techniques" will require team consensus. The two master lists of NRM techniques (the techniques used and those known but not used) in this report provide the basis for making the decisions. Using categories of techniques to resolve this problem of definitions is discussed below in this section.

The PTS and its data do not provide the basis for defining "new" NRM techniques and, in fact, we find that the concept of "new" techniques is problematical rather than useful. "Newness" depends on factors such as the NRM traditions in a region, the historical sequence of projects and extension efforts in an area during the past decades, and the ages and perspectives of the survey respondents. Very few techniques can be defined exclusively as "new" or "traditional." Many of

the “new” techniques being promoted by projects are based on similar traditional practices so that producers justifiably may subjectively classify them as either “new” or “traditional.” Some PTS respondents classified the use of rock dikes and *zais*, protecting natural regeneration, and leaving tree stumps with at least one dominant stem (*defriche ameliore*) as traditional techniques. They reported that some villagers, under some conditions, had used these techniques before the colonial era. Younger respondents reported that animal traction is a traditional technique because it has been practiced as long as they can remember; older respondents tended to classify the techniques introduced in the colonial era and afterwards as “new.”

Unstandardized NRM terminology compounds the problems of defining NRM techniques and new techniques. There is a plethora of terms for NRM techniques, so that different projects may promote very similar techniques and give them different names. This proliferates the number of “NRM techniques” and “new” techniques that exist in Niger. Techniques may be mislabeled as “new” due to project- or area-specific names. All these factors complicate data analysis, as they create problems with definitively identifying techniques and collapsing the same ones with different names under one name.

The PTS data show that if “new” NRM techniques are defined broadly to include those promoted in recent decades by government extension services--such as animal traction, the use of modern inputs, livestock corridors, and dikes or dams to control water--then most people already know about them. The data also show that if “new” techniques are defined more narrowly as those introduced by recent NRM projects (eg., using project-specific terms for them), then people probably will know about them only where these NRM projects have been or are working.

Based on the PTS, we can recommend three options to address the issues of defining NRM techniques and new techniques. One option is simply to not use the words “new” or “traditional” to classify NRM techniques. With this option, differences between the lists of NRM techniques generated by S.O.3’s sequential surveys would be classified as “new” techniques, meaning that they were “new” to the producers and S.O.3 when they were reported. Another option is to make a list of 20 or fewer techniques that S.O.3 considers to be “new” and significant, in terms of their environmental impact and geographical distribution, and to monitor those over time. The potential problem with this option is that the list could become outdated soon and monitoring the list would be short-term. Or, S.O.3 could make a new list of “hot new techniques” for each survey, which would produce data about the use of different sets of “new” techniques used at different points in time, rather than producing data about changes in the use of one set of techniques over time.

We recommend that S.O.3 eliminate the term “new” and classify NRM techniques into categories in order to resolve these problems of definition and unstandardized terminology. **We believe that, in tracking change in NRM technology over time, it is less important to focus on whether techniques are “new” or “traditional” than it is to focus on their positive impacts on sustainable production and the natural resource base.** Thus, categories of “high impact” or “priority” NRM techniques, and the numbers of people using them, could be derived from the PTS survey and consultation with S.O.3’s partners. Identifying these “priority” categories should be done by convening a multidisciplinary group of NRM professionals in Niger and reaching a consensus. This participatory process would produce a list of “priority categories” acceptable to all the NRM actors and support collaboration among them.

We also recommend that S.O.3 define categories of techniques based on their purposes (ie., control soil erosion, improve water retention/infiltration, produce trees). Using categories of techniques to classify and analyze the survey data will: 1) solve the problem of defining techniques as "new" or "traditional;" 2) solve the unstandardized terminology problem, which will eliminate the potential problem of counting the same technique more than once; 2) give S.O.3 a more convenient dataset to work with (the list of categories will be shorter than the list of individual techniques); and 3) contribute toward standardizing NRM research in Niger, by giving agencies a common frame of reference for collecting and comparing data. The 1996 NBS would use the coded list of NRM techniques compiled for the PTS to record data in the field, and then collapse the responses into the "priority categories" before the data entry.

The following is a draft list of priority NRM categories, which should not be considered final or all-inclusive:

Categories of NRM techniques used by individual respondents (for men's and women's individual questionnaires):

1. Cultivate or orient rows perpendicular to the slope.
2. Contour- or location-specific rock dikes, earthen dikes, or bunds to control soil and water erosion.
3. Contour- or location-specific strips of grass or trees to control soil and water erosion.
4. Use of bunds or trenches to stop excess water from entering fields.
5. *Zais*, demi-lunes, or other forms of micro-basins to enhance water retention and infiltration.
6. Techniques to control erosion in ravines and gullies: rock dikes to control water flow or protect banks; planting grass or trees to protect the sides of ravines.
7. Dune stabilization (physical or biological barriers, protection from livestock, spreading manure on the dunes).
8. Mulching (use of grass, stalks, or branches to cover soil and enhance water infiltration).
9. Use of animal traction equipment to prepare land.
10. Use of traditional soil improvement techniques (bury weeds and plant on the mounds the following year).
11. Manual, gravity, or pump irrigation to increase crop productivity.
12. Manure contracts with herders or stake livestock on fallow land to increase crop productivity.
13. Plant trees or bushes in fields.
14. Leave numerous stumps with one or more dominant stems when clearing fields.
15. Restrict livestock access to a certain portions of family land to allow tree seedlings to grow.
16. Protect tree or bush seedlings found growing in fields and fallow land.
17. Plant trees, bushes or euphorbia around or along fields as live fencing or windbreak.
18. Encourage Gao trees (*Acacia albida*) to grow in fields, but eliminate stumps and seedlings of most other species.
19. Harvest trees and bushes growing in fields for fruit, forage, fuelwood, and poles.
20. Plant multipurpose trees in or around the concession.
21. Maintain orchard, woodlot, or individual trees in order to sell fruit or other tree products.
22. Restrict the cutting of trees growing on family land to family members.
23. Plant, protect, prune, or otherwise maintain individual trees or groups of trees on communal land.

24. Use the same piece of family land each year as pasture or an area to stake livestock during the cropping season.

25. Restrict access to family pasture land to family livestock.

26. Protect pasture land and fields from bush fires.

27. Improve long-term pasture or pastured fallow land by seeding grasses or applying fertilizer.

28. Send livestock on seasonal transhumance.

29. Consign livestock to herders for the entire year to graze outside the village.

30. Transplant or collect pasture grass to feed to livestock.

31. Collect and store crop residues or bush grass to feed livestock in the dry season.

Categories of NRM technologies used by villages to manage communal resources (for village-level questionnaires):

1. Village has a territory management plan or has begun the process to develop a plan.

2. Treatment of portions of village territory with contour bunds or dikes to protect micro-watershed.

3. Treatment of portion of village territory with grass strips or trees to reduce soil and water erosion.

4. Treatment of portion of village territory with *zais*, demi-lunes or other micro-basins.

5. Dune stabilization (physical or biological barriers, protection from livestock, spreading manure on the dunes).

6. Techniques to control erosion in ravines and gullies: rock dikes to control water flow or protect banks; planting grasses or trees to protect the sides of ravines.

7. Village or /collective irrigation system.

8. Plant a village woodlot.

9. Plant windbreaks traversing village territory.

10. Village agreement that restricts cutting trees and bushes on all or a portion of village territory to increase wood resources.

11. Village agreement limiting sale of poles and fuelwood.

12. Village nursery to support tree and grass planting programs.

13. Plant, protect, prune, or otherwise maintain trees on communal land (village forest, woodland, bush).

14. Exclude livestock from a portion of village territory to promote regeneration of grass and trees.

15. Village agreement to prohibit bush fires to protect grass and trees.

16. Village agreement to restrict use a specific portion of the village territory only for pasture.

17. Village agreement that restricts cultivation of village bush land to maintain communal pasture.

18. Improve communal pasture by seeding or applying fertilizer.

19. Village agreement that restricts cultivation of inter-village bush land to maintain communal pasture.

20. Establish livestock corridor/s across village territory to facilitate livestock access to water and pasture resources.

21. Traditional open wells.

22. Cement open wells.

23. Tube wells.

24. Village water system with neighborhood faucets.

25. Village maintains wells, water depth, and area around wells to preserve water quantity and quality.
26. Village is organized to make regular contributions to a fund to maintain pumps and well infrastructure.
27. Periodically deepen or otherwise maintain natural water reservoirs (*mares*).
28. Man-made water retention structures (dams or large solid dikes).

E. Recommendations for Revising the S.O.3 Indicators

Based on the results of the PTS, there are three indicators that are impractical to operationalize and measure. These are: 1) Percent of household heads, both men and women, reporting the use of one or more new NRM techniques; 2) Percent of household heads, both men and women, able to identify at least one new NRM method; and 3) Percent of household heads, both men and women, able to describe at least one NRM practice used in another village. The first indicator should be redefined in terms of the "priority" categories discussed above, which will eliminate the word "new" from it. It can be redefined as: **Percent of household heads, both men and women, reporting the use of NRM techniques in one or more priority categories.**

The survey questionnaire asked people about NRM techniques in two major domains: the techniques they currently were using, and those that they knew about but were not using. The latter was to measure people's "identification" of new NRM techniques, which corresponds to the second indicator above. We recommend eliminating indicator number two above because it is impractical to measure. We found the following problems with the question of asking people to identify techniques that they did not use: 1) the question was abstract, which made it more difficult for producers to answer than concrete questions about which techniques they actually were using; 2) people may have interpreted the question as an implied criticism; and 3) people apparently found it tedious and repetitive, after answering similar questions about the techniques that they actually were using in their fields.

A different approach to tracking change over time in people's knowledge of NRM is necessary. The alternative that we suggest obviously must be field tested. The indicator we suggest is: **Percent of male and female household heads that can name one or more techniques in S.O.3's first three categories of priority techniques.** This might produce better measures of people's knowledge and the diffusion of some key NRM techniques. It will have the same problems as its predecessor, in terms of interviewing people, but the fact that it could be framed as three short questions should reduce these problems.

The PTS indicates that the level of knowledge of NRM techniques already is quite broad among rural men and women. We conclude that a majority of people probably already know about techniques such as animal traction, the use of modern inputs, irrigation, planting/maintaining different species of trees in and around fields and villages, livestock corridors, dikes or dams to hold and control water, and cement wells. We found that many people in non-project villages know about the NRM technology promoted in project villages, but in most cases they are waiting until the GON or a project extends material assistance or direct incentives to adopt it.

We also recommend eliminating indicator number three above, which was designed to track the diffusion of knowledge about NRM technology. This indicator also is difficult to measure. In terms of survey methodology, it implies that: 1) qualitative data from a discussion will be collected during survey interviews, which generally does not fit in the format of a structured

survey; and 2) S.O.3 will collect information on all the NRM practices that projects are promoting throughout Niger in order to verify the survey responses. There is no way of evaluating the accuracy of the survey responses if the latter is not done. Collecting the information about all the techniques used in all the villages in Niger and verifying the survey responses would entail much work.

Many people in non-project villages already can describe an NRM practice that they do not use that neighboring villages do use. People without cement or tube wells usually can describe these technologies, which have been provided by a project in a neighboring village. Many villagers can describe the pump mechanism on their wells and explain the different mechanism on the pump in a neighboring village. Most people already know something about techniques such as animal traction, fertilizer, pesticides, natural regeneration, protecting areas from livestock and fire to encourage regrowth, leaving some trees when they clear their fields for cultivation, livestock corridors, and the use of rock or earthen dikes to control water, even if they do not use them. The reasons for not adopting such known techniques--resource constraints, lack of sufficient knowledge, tradition, lack of incentives, or the belief that such interventions are the government's responsibility--remain in question.

The PTS questionnaire operationalized S.O.3's question about the diffusion of information about NRM technology by asking people about their sources of knowledge of NRM techniques. The data provide some understanding of the diffusion of information about NRM, but they probably are not an appropriate basis for making policy and programming decisions. It is likely that people's responses were biased by their age and by their evaluation of which responses were politically correct to the survey team.

The second indicator could be reformulated as: **Percent of male and female household heads whose source of knowledge about one or more techniques in S.O.3's first three priority categories is another village.** This would require adding some specific questions to the questionnaire and field-testing them.

Using only structured national surveys to monitor S.O.3's indicators over time is problematical. Data from all one-time survey interviews are self-reported and unverified data, and thus liable to various biases. Such data are "ballpark figures." Therefore, we strongly recommend that S.O.3 conduct data collection activities that are complementary to its formal, national-level surveys. We recommend that S.O.3 identify a subsample of households from the National Baseline Survey and conduct a follow-up study focused on the S.O.3 indicators in order to generate additional data and evaluate the NBS data. Activities such as focused community studies, topical studies, and informal surveys also should be done to assess and explore the NBS findings.

The following are alternative or additional indicators that S.O.3 could consider using, in conjunction with the categories of "priority techniques:"

1. The index of villages, both project and non-project, reporting use of the priority categories of NRM technologies by the village on communal land and with the communal natural resources of the village. (The index number would be the mean of percentages reported for use of each priority category of technologies by all village responses. The value of this index by region, farming system, or project area, as well as for the entire sample, could be useful for analysis.)

2. The index of heads of households, both men and women, reporting use of the priority categories of NRM technologies by the household on collective its fields and with the collective natural resources of the household. (The index number would be the mean of percentages reported for use of each priority category of technologies by all households.)

3. The index of women reporting use of the priority categories of techniques on their fields and with the natural resources that they own or control personally. (The index number would be the mean of percentages reported for use of each priority category of technologies by all women respondents.)

4. The index of village responses regarding priority categories of technologies that are either promoted in the local area by a project or agency, or are used in a neighboring village, but are not used in the survey village. (The index number would be the mean of percentages reported in village responses for each priority category of technologies promoted in the local area by a project or agency, or used in neighboring village, but not used in the survey village.)

5. The index of household head responses regarding priority categories of technologies that are either promoted in the local area by a project or agency, or are used in a neighboring village, which the household head does not use. (The index number would be the mean of percentages reported in household responses for each priority category of technologies promoted in the local area by a project or agency, or used in neighboring village, but not used in the survey village.)

6. The index of women's responses regarding priority categories of technologies that are either promoted in the local area by a project or agency, or are used in a neighboring village, which the woman does not use. (The index number would be the mean of percentages reported in household responses for each priority category of technologies promoted in the local area by a project or agency, or used in neighboring village, but not used in the survey village.)

7. Percent of men who recognize the term "Rural Code."

8. Percent of women who recognize the term "Rural Code."

9. Index of men and women that know about the major themes of the Rural Code. (The index would be the mean of percentages reported for each of the questions on Code Rural topics.)

10. Heads of households, both men and women, with access to market and climatic reporting services, measured in terms of an index number of household heads who heard radio reports on market and climatic conditions. (The index number would be the mean of percentages reported by household heads for each question related to having heard radio reports on crop and climatic conditions and crop prices.)

11. Percent of household heads, both men and women, reporting that they obtained credit from non-traditional sources (projects, agencies, NGOs) during the previous year.

12. Percent of villages with a territory management plan or involved in a process to develop a village territory management plan.

F. The Sampling Strategy for 1996

F1. A Stratified, Random Sample of Rural Villages

The PTS sample was a random, village-based sample stratified into villages currently working with NRM projects and those that were not. The PTS shows that this sampling design is appropriate for producing data to compare these two key populations, so we recommend using it with the 1996 National Baseline Survey. The proportion of project villages in the sample should be proportionate to their total number in rural Niger. Because we do not know how many project villages there are in Niger, we recommend that they constitute at least one-third of the NBS sample. This should ensure that they comprise a large enough sample size for analysis independent of the rest of the sample and that they produce representative data. We estimate that a sample size of 250 villages will be necessary in order to survey 1,500 concessions for the NBS; the number of project villages in the sample only can be determined when their total number in Niger is determined.

The village is an important unit of analysis for a survey of NRM technology. The communal management of natural resources should be addressed at the village level, as the PTS did. The number of villages per department selected for the NBS sample could be proportionate to the population of the department, and the number of households surveyed per village could be proportionate to the village populations. This proportionate sampling depends partly on the differences in population among departments and villages in Niger.

The NBS sample should be linked to Niger's administrative units of *arrondissements* and departments. Much of the data collection in rural Niger uses sampling strategies based on the listframe of the country's rural villages and its administrative units, so S.O.3 will be using a common sample design. This will facilitate S.O.3's use of GON data, particularly agricultural production data, as contextual information for their NRM surveys. It also may facilitate comparing and sharing the S.O.3 data with the GON and other agencies whose research and projects are organized in terms of those administrative units. For example, the FAO is planning to conduct an agricultural census, based on a sample of Niger's villages, which should generate pertinent information for S.O.3.

The stratified, random sample design has two other major advantages. First, it will be possible to identify which NRM projects are working in which villages and to collect information about which NRM techniques they are promoting. It will be necessary to collect this information only for the project villages in the survey sample. The PTS shows that the enumerators need this background information in order to interview effectively.

Second, the PTS found that in some regions the village chiefs have lists of all the households in their villages, which also list the number of people in each household who pay taxes (people over 15 years of age and non-students.) GON officials reported that these village tax lists are available at the *arrondissement* offices if not from the chiefs, which information must be verified. Theoretically the lists are revised annually but they may be inaccurate because they tend to retain deceased taxpayers and omit new households. However, they could be revised in consultation with the village chiefs, which would be more cost- and time-effective than re-censusing all the villages selected for the survey sample. Using the village tax lists is an option that will decrease the cost of the 1996 survey, which is advantageous in a time of limited funds. We recognize that this is likely to produce some sampling errors, but it is still a viable option for the NBS.

F2. Using the Demography and Health Survey's Rural Sample

Using part of the sample designed by the Demography and Health Survey (DHS) may be an alternative to the village-based sampling strategy discussed above. The DHS national sample was designed to target Nigerien women of child-bearing age (25-49.) It was divided into three components: urban (Niamey), secondary urban, and rural. The rural sample was the largest component (4,000 households) and theoretically also should represent the Nigerien women who are economically active in agriculture and NRM. It is possible that a subsample could be drawn from the DHS sample and used for the 1996 NBS or that some supplementary re-censusing would produce useful listframes for the NBS, with technical assistance from DSCN. The advantages would be: 1) minimal sampling errors, because the DHS re-censuses in order to produce accurate listframes; 2) sampling costs reduced or shared with the DHS; and 3) contextual information on household socioeconomic status and health from the DHS.

The DHS constructed its sample by drawing a sample of 235 clusters from the 4,479 census zones constructed for Niger's 1988 national censuses, and re-censusing them. This produced accurate listframes from which to draw a sample of households in each cluster. DSCN personnel who had worked on the 1988 census did the re-censusing, which took four months. A subsample for the NBS probably could be identified in collaboration with the DSCN. If the 1996 and subsequent S.O.3 surveys were conducted within a year after each Demography and Health Survey it might not be necessary for S.O.3 to re-census its survey sites.

Using the same sample for the S.O.3 and the DHS surveys would give S.O.3 contextual information about the rural population. The DHS survey collects some data that can be used to characterize household socioeconomic status, such as housing types and material possessions, as well as some health data. The PTS did not collect these data due to the limitations of time on survey interviews. Data on household socioeconomic status would be useful, as it would allow S.O.3 to explore the relationship between household socioeconomic status and NRM technology.

The DHS sample was not based on village-level population units. This may constitute a limitation on using or adapting it for the NBS. Whether or not the DHS sample design could accommodate the project/non-project stratification also must be explored in collaboration with DSCN.

F3. An Area Sample Frame

An Area Sample Frame is constructed using satellite data to divide a country into segments. The segments are defined using markers such as roads and geographical features (rivers, mountains, land-use patterns). An ASF is an area-based sampling technique that is used mainly to measure agricultural production, so one village may be divided into various segments. S.O.3 has considered using an ASF for the 1996 baseline survey but we do believe that it is inappropriate, for several reasons.

Socioeconomic research such as S.O.3's surveys generally use population-based sampling strategies. An ASF segment could include households from more than one village, which would complicate selecting the village-level component of the S.O.3 sample. Household fields could be located outside an ASF segment, which would complicate field visits or follow-up studies focused on producers' fields. Working with ASF segments rather than with villages would complicate the process of identifying which NRM projects are working in which survey villages, and the process of stratifying the survey sample into households from project and non-project villages. One major

disadvantage of using an ASF is that, unless the other actors in NRM agree to use it, it would be difficult to compare or contextualize S.O.3's data with the other NRM and agricultural production data produced in Niger. Another disadvantage is that using this different sampling strategy would not contribute to the USAID's and the PN/GRN's work of standardizing research and producing national-level information for all the NRM partners in Niger. An ASF would minimize sampling error, but it would have no effect on the non-sampling errors that are endemic and a more significant problem in all surveys. We believe that it is preferable to use a population-based sampling strategy to collect socioeconomic data, because it is consistent with the social units that are the object of S.O.3's research: villages and their households. The strategy of selecting a random sample of Niger's villages and using village tax lists as listframes to select households will have the same non-sampling errors as using an ASF, and it is more cost-effective.

G. The 1996 Questionnaire

G1. Communal and Private Resource Management

The PTS experience demonstrates that the village is an important unit of analysis for a survey of NRM technology. Individuals rarely are involved in conserving or improving communal natural resources except as members of a village activity, organized and promoted by a project or government agency. Household heads relate almost every aspect of household management of natural resources to household land. Thus investigating people's management of natural resources can be divided into investigating their communal and private domains. When people were interviewed about the four major categories into which natural resources were separated on the PTS questionnaire (fields, trees, pasture and water), the same NRM techniques often were reported several times because the techniques used with each resource were used mainly on their fields. Few people had private pasture land or forest land, other than fallow fields, so virtually all the techniques for managing land (outside the concession) and done by an individual or household group were reported in terms of fields (agricultural land broadly defined to include fallow).

Therefore, separating natural resources into four major categories and recording people's responses about the techniques used with each one in separate tables in the survey questionnaire was inappropriate and led to considerable duplication in the responses. As people do little to manage pasture land (other than to fallow the fields used for pasture), most of the responses about pasture management in fact are ways to manage the limited pasture resources that people have. The common responses about pasture management were collecting and storing crop residues and bush hay for feeding livestock during the dry season. Some people have areas of land reserved for pasturing livestock, although in most cases this is primarily a means of increasing the fertility of fallow land before returning it to cultivation. The PTS indicates that for individuals and households, land use management relates primarily to the management of agricultural land and to agricultural productivity.

One consequence of this dividing NRM into private and communal domains is that the responses from individual men and women in a village about managing communal resources (drinking water, communal forest land, communal pasture land) are virtually the same. A few villages identified communal forests or pastures but in most cases uncultivated land was classified as bush land. Some village groups reported that no bush land remained. In these cases, communal land resources consisted mainly of fallow fields and cultivated fields that had been harvested.

This private/communal division in resource management can be used to advantage to simplify the survey methodology. The 1996 NBS questionnaires for men and women should focus on their agricultural fields and eliminate the separate tables for tree, pasture and water management that were on the PTS questionnaires. This will make it necessary to prompt respondents to remind them of the NRM technique for trees, pasture and water used on their fields. This integrated approach--focusing on agriculture/agricultural fields as a subset of NRM--corresponds better to villagers' conceptualization of their world. Questions about the availability and management of communal resources--water, forest, pasture, and bush resources--then could be limited to a village questionnaire.

G2. The Open Question Format

Using open questions was appropriate to ask people about the NRM technology that they currently were using. This format probably under-reports the actual number of techniques that people use. (Farming systems surveys indicate that producers focus on the current stage of the agricultural season and under-report constraints or techniques that are important in other stages of the agricultural season.) During the course of the PTS it became apparent that the enumerators needed information about local projects in order to formulate the prompts necessary to elicit responses about the NRM techniques they were promoting and producers might be using. Using well-informed prompts, the number of techniques that producers reported using increased and included most of the techniques being promoted in an area. The combination of the open question format and well-informed prompts thus is an effective methodology for eliciting more complete responses.

The open question format was inappropriate for asking people about the NRM techniques that they knew about but did *not* use. The problems in this case apparently were that the questions about knowledge of NRM technology were abstract (focussing on "knowledge" rather than producers' actual practices); that these questions may have been interpreted as criticisms; and that people found it tedious to list techniques that they did not use. Also, it was difficult for the enumerators to use prompts in this case without leading the respondents. The survey team found that asking villagers specifically about techniques promoted by a local project or observed in a neighboring village that they were unable to adopt usually increased their responses. Asking about the knowledge of NRM technology this way is less "open" but may produce better responses by making the question less abstract and less critical. Asking people about their knowledge of NRM only in the context of field- related activities also may make the question more concrete and improve the responses.

It might be possible to replace the questions about "NRM techniques known but not used" by asking whether respondents are familiar with a specific list of 30 or fewer techniques. This could be difficult due to unstandardized NRM terminology (different names for the same technique), lack of definitions of techniques, and regional differences in projects' promotion of NRM technology. If the open question format is retained for "NRM techniques known but not used," the preferable approach may be to frame it in the context of techniques known from project activities or neighboring villages that the respondent has been unable to adopt. This would produce information primarily about diffusion.

The individual questions on the survey questionnaire are reviewed in Annex VI at the end of the report.

SECTION IV
TECHNICAL RECOMMENDATIONS
FOR THE 1996 NATIONAL BASELINE SURVEY

The following technical recommendations are based on the authors' experiences in designing and implementing the 1995 Pre-Test Survey (PTS). The recommendations are in the order in which they should be done during the year-long process of designing and implementing the 1996 National Baseline Survey (NBS). Estimates of the amount of time necessary for each recommendation are provided.

A. S.O.3 Collaboration to Revise the Survey Questionnaire

The process of producing the final questionnaire in collaboration with the S.O.3 team can be better organized in order to improve efficiency and team participation. The major problem for the consultant was the lack of concrete, written input from all the team members. The process will be easier in 1996 because it will be based on the 1995 survey questionnaires, but in order to improve it we recommend organizing it into the following steps:

1. The S.O.3 team reviews and agrees on the *prioritized* list of information needs (data) that the PTS survey addressed. The team recognizes that the survey can not collect all the information that S.O.3 needs due to limitations on the length of the questionnaire; thus the need for agreeing on the information priorities. The S.O.3 team already has been through this process once, so the 1995 questionnaires included in this report should reflect their information priorities. The information needs that cannot be addressed by the National Baseline Survey constitute a specific set of data needs that must be collected using other methodologies.

Time: 3 weeks.

2. The Consultant Team (contractor and GON homologues) reviews the team's information needs in terms of the 1995 survey questionnaires and makes revisions as necessary. The 1996 draft questionnaires are distributed to the S.O.3 team members, who make written comments and corrections on them within a period of time specified by the team.

Time: 3 weeks.

3. The Consultant Team revises the 1996 draft questionnaires, based on the S.O.3 team's written comments, and then field-tests it. Further revisions are made based on the field-testing, and the field-tested drafts are distributed to the S.O.3 team for written comments, within a specified time period, followed by a meeting to discuss the draft. This process continues until all three questionnaires are finalized.

The initial field-testing necessary to revise the questionnaires and the translations should be done by a small team of experts. This will ensure that problems in the field are due to flaws in the questionnaire design or translations and not to lack of expertise in the interviewers. When the questionnaires are revised and functional, the trained enumerators can field-test them in Niger's different agricultural systems, as discussed below. This division of labor is necessary so that flaws in the questionnaires are not confused with or compounded by inexpert interviewers.

Time: 12 weeks. This includes the field-testing necessary for Recommendations B. and C. below.

B. Field-Test the Draft Questionnaire in Different Agricultural Systems

The 1995 PTS questionnaire was administered in three different agricultural systems. Information from farmers and projects in each site added to the coded list of NRM practices (Annex III) and to the coded lists on the questionnaires. It will be necessary to field-test the 1996 survey questionnaire in Niger's other agricultural systems in order to ensure that it is usable country-wide and to finalize these coded lists. The agricultural and social characteristics of the regions that were not surveyed in the PTS may require some adjustments in the questionnaires.

This field-testing can be combined with testing the questionnaire's translation into Hausa and Zarma. When the questionnaires are in final form, the trained enumerators can do the field-testing throughout Niger. This field practice also will improve the enumerators' efficiency: the PTS enumerators graduated from doing two interviews per day to three, by the third week of the survey.

Time: included in the 12 weeks allocated to Recommendation A. above.

C. Pre-Code the Survey Questionnaire

A coded master list of the reasons why people do or do not use NRM techniques should be compiled from the four coded lists that already exist on the 1995 PTS questionnaires (Annex V). This "Reasons" list will resemble the coded master list of NRM techniques in French, Hausa, and Zarma that was compiled for the 1995 survey (Annex III). The master list of "Reasons" will simplify the enumerators' work in the field as well as the data entry and analysis. Field-testing the 1996 questionnaires in Niger's other agricultural regions will generate new terms to add to the 1995 coded "Reasons" list and to the coded list of NRM techniques. Adding to these lists is a necessary part of finalizing the 1996 questionnaire.

Time: included in the 12 weeks allocated to Recommendation A. above.

D. Design the System for Data Entry and Analysis

The data entry formats and the output tables for the data analysis should be designed and tested before the survey begins. This will ensure that the data output will be in an appropriate form. This requires that S.O.3 specify the type and form of data that it needs for reporting and in the final survey report. The process will require collaboration between S.O.3, the Consultant Team, and DSCN. The data generated by field-testing the final questionnaires should be used to test the data entry and analysis system so that it can be finalized before the survey begins. The entire survey process must be tested on a small scale beforehand: data collection, input, quality control, and analysis. This will make it more efficient and decrease errors during the large-scale exercise. Supervision of the data entry process and a quality-control system also should be set up at this time.

The PTS shows that supervision of the data input process is essential. This includes monitoring the databases continuously (quality control) in order to identify and correct input errors before they accumulate. The DSCN personnel did not do this independently, as part of their work with the PTS. As a result, numerous basic errors were found in the databases during

the analysis (questionnaires entered twice or not at all, incomplete entries, compounded entries, misnumbered questionnaires). Supervision is the best way to control these problems.

Time: 8 weeks.

E. Administering the Questionnaire in Niger's Eight National Languages

The DHS survey was translated into Hausa and Zarma only, as these languages are used by approximately 75% of Niger's population. Native Hausa and Zarma speakers fluent in Niger's six other national languages administered the questionnaire in those other languages. We recommend using the same procedure for the 1996 survey. It will be necessary to make a list of all the key terms in the questionnaire and the master list of NRM techniques (e.g., *concession, technique d'aménagement, activités économiques*) and translate them into each of the national languages in order to ensure that the enumerators use standard terminology in surveying different ethnic groups. (This was done in Hausa and Zarma for the 1995 survey; see Annex IV). Translating these key terms will require working with native speakers of each national language who also have expertise in NRM.

The enumerators and supervisors will require specific training and practice to learn the survey vocabulary for each ethnic group/s that they will survey. The DHS survey used the Centre de Formation des Cadres de l'Alphabétisation to train their enumerators in Hausa and Zarma. The survey personnel also will require some training in NRM and NRM techniques, particularly the women.

Time for training: 2 weeks.

F. Standardizing the Terminology for NRM Technology

Standardized terms for NRM techniques evidently do not exist in Niger, so that projects and people in different regions often use different names for the same techniques. Different projects may promote similar techniques, that are done slightly differently, and give them different names. And many of the modern techniques are based on similar traditional practices. Obviously this complicates the work of accurately documenting the NRM techniques that people know about and use. It makes field training essential for the survey personnel, so that they can recognize the techniques commonly used by projects or people from verbal descriptions.

Lists and definitions of the NRM techniques from the NRM projects in Niger should be collected early in the process of preparing for the 1996 NBS. The objectives are to: 1) list all the techniques being promoted by the NRM projects in Niger, in the areas that will surveyed; 2) identify which techniques are the same but have different names and put them in categories, as recommended above; and 3) provide the project-specific information to the enumerators. The enumerators will need lists of the NRM techniques being promoted by each project as background material to enable them to elicit accurate information from the people in different areas. If the 1996 survey sample will be limited to defined regions or NRM projects, only the lists from those areas will be needed.

Time: 12 weeks.

G. Survey Timing and Field Staff

G1. Survey Timing

The survey interviews must be done when the rural population is less occupied with its agricultural work, which is after the winter harvest. This may be as early as November or December, although harvest dates vary by region. The dry season, January through May/June, generally is the period when people have less agricultural work to do, but it also is the period when men leave on *exode*. We recommend doing the NBS survey during November through January. The PTS was conducted during the month of November. We found that most people were still occupied with agricultural work, but they also had the time to be interviewed.

G2. Survey Field Staff

Following the methodology of the 1995 PTS, we recommend that the enumerators work in male/female pairs to interview one man and woman per concession. Each enumerator-pair can complete two or three interviews in a village in one day. A field team consists of three pairs of enumerators plus a supervisor and a team leader. The two latter will conduct the group-level village interview in each village; they also are responsible for introducing the team to the projects and villages to be surveyed, and maintaining quality control of the completed questionnaires.

A total of thirty enumerators, five supervisors, and five team leaders will be necessary to complete the sample of 1,500 concessions for the 1996 NBS within three months. Ten vehicles and drivers will be required. These figures are based on the following estimates:

- A field team consists of three male and three female enumerators, one supervisor, one team leader, two drivers, and two vehicles.
- The field team can survey 6-9 concessions and one village-level group in one village per day, during three consecutive days. Five field teams working simultaneously will complete a minimum of 30 surveys per day. At this rate, 50 days of field-work are necessary to survey 1,500 concessions. (Note that this will produce 3,000 individual questionnaires: 1,500 from men and 1,500 from women. It also will produce one questionnaire from each village surveyed, or approximately 250 village-level questionnaires.)
- Each team will need 20 additional days in the field to review and correct their completed questionnaires (quality control.) Based on the PTS, we recommend that three days of surveying be followed by one day of work on quality control.
- Approximately 20 days will be needed for traveling and contingencies.
- The field staff will need 3 days per month of leave in Niamey, in order to attend to family matters and rest from the intense fieldwork.

Total: approximately 14 weeks (100 work and leave days) to survey 1,500 concessions.

The field staff will consist of:

- 15 male enumerators
- 15 female enumerators
- 5 supervisors
- 5 team leaders
- 10 drivers and 10 four-wheel drive vehicles

H. Training the Survey Field Staff and the Data Entry Staff

H1. Classroom Training

Both men and women should be hired for the 1996 NBS, because same-sex interviews are socially appropriate in rural Niger. The enumerators will require one month of training. This includes classroom training in the survey methodology and objectives, interviewing techniques, and data recording techniques. It also includes field-training in interviewing techniques and completing the questionnaire.

The data entry personnel should attend part of this training in order to learn about the types of data and the field-work methodology with which they are working. The data entry supervisor should collaborate in teaching the enumerators proper data-recording techniques. The PTS shows that linking the field staff with the data entry staff is essential; it also was done by the DHS.

H2. Field Training in NRM

There are very few women in Niger who have an education or work experience in agriculture or NRM. This creates a problem in finding female enumerators with appropriate backgrounds for S.O.3's NRM surveys, who are necessary because it is socially appropriate to have them to interview the rural women. (There are some women technicians who have worked with the GTZ-PASP project who should be experienced candidates.) It will be necessary to identify women who already have experience in survey work and give them some basic training in the theory and practices of NRM related to S.O.3's survey. The training will require approximately three weeks, one week in the classroom and three weeks in the field. We recommend field training for the men as well as the women enumerators, because it will contribute to inter-interviewer reliability in the survey (i.e., enumerators using the same terms to record the different NRM practices reported.) It also will improve their efficiency in conducting interviews and their effectiveness in eliciting accurate responses.

Time for classroom training: 5 weeks.

Time for field training: 3 weeks.

I. Quality Control of the Questionnaires and Data Input

Our experience with the 1995 PTS was reiterated by the DSCN: time and personnel must be available to thoroughly review and correct the survey questionnaires *before* the data are input. This is necessary to control the input errors. DSCN reported that insufficient supervision in large surveys generally leads to lack of this quality control and the proliferation of incorrect data in the databases. We recommend that time and personnel to control the questionnaires in the field is built into the 1996 survey.

This quality control should be a three-step process. First, the field supervisors and the enumerators must have time to review and correct the questionnaires in the field. Second, some DSCN personnel must be designated to check the questionnaires before they are given to the data inputters. And third, each database (men, women, village) must be checked every two weeks, or as the input for a set of villages is completed, to ensure that basic input errors have not occurred (questionnaires misnumbered, skipped, or entered more than once.)

Time: every fourth day of fieldwork and continuous with the 14 weeks of data input..

J. The Process of Working with DSCN

DSCN reported that they work with donors by responding to donors' proposals (or Terms of Reference). The donor gives DSCN the TOR, DSCN submits the budget, and it is negotiated. Donors generally provide the money and the DSCN provides the personnel needed to do the work. DSCN then is completely responsible for carrying out all the work--questionnaire design and pretest, hiring and training enumerators, data input and analysis--within the allotted budget and time. However, since the DHS survey of 1992, UNDP has been the only agency to work with DSCN on large surveys. UNDP was conducting a national survey while the 1995 PTS was being done but the manager (Mme. Zoule of the PADEM project) was unable to meet us to discuss the process of working with DSCN.

We found one consistent problem working with DSCN during the different stages of the PTS: the staff was working on other projects at the same time. The person designated to reformat the questionnaire also was in an FAO training course, the data input supervisor was working the night shift for UNDP and the day shift for us, and the data inputters had other work to do. As a result, more time was spent to complete the PTS work than originally scheduled. This was a serious problem with reformatting the questionnaire, which finally we did ourselves, because after three weeks DSCN's product still was unacceptable. (The two private computer consultants we hired were not sufficiently expert with WordPerfect to do a good job either.) However, the data input procedure (design of the input format, hiring and supervision of the two data inputters, collaboration with us to clean up the data) overall was done on time, despite the staff's simultaneous work on another project. As the PTS was intermittent collaboration at short notice, it is possible that DSCN would work better on a larger, longer-term USAID project.

The private-sector alternative for computer work is Gamma Informatique (Mr. Kabo Mahamane, Director). Mr. Kabo gave us prompt attention but his charge to set up the data input format would have been 900,000 CFA, versus DSCN's charge of 35,000 CFA. Gamma Informatique can identify local consultants for specific tasks but they do not have the experience and could not find anyone capable of working with a large-scale national survey or using SPSS.

We recommend that S.O.3 collaborate with DSCN to do the NBS. However, S.O.3 should obtain an evaluation of DSCN from Macro International, that worked with them to do the 1992 DHS, and from UNDP, in order to benefit from their experience and recommendations also. Contracts specifying full-time work evidently will be necessary to ensure that DSCN personnel have only one employer at a time. Supervision and regular reporting to S.O.3 during the entire survey process also will be necessary to maintain quality control. Supervising the DSCN personnel and the data input/analysis process will be a full-time job; we recommend creating a position for it, and not make it a direct responsibility of the Survey Director.

K. Personnel Salaries

K1. Enumerators

The current remuneration for the enumerators who work on surveys such as S.O.3's PTS or those conducted by the UNDP is 10,000 CFA per day. This is called "per diem" rather than "salary" and it is their only cash remuneration. The enumerators provided all the materials they needed for travel upcountry; we provided only pencils, pens, and folders.

Prepared meals from commercial sources are not available in the Tillaberi area. This was a problem for the field team because the field vehicles had to transport kitchen materials and food supplies and the women spent time cooking every day, which made team meetings difficult to organize. We recommend that S.O.3 organize a "chuck wagon" or contract with some local people to resolve this problem.

K2. DSCN Staff

In November 1995, UNDP was paying data inputters 60,000 CFA per month for work contracts of two to three months duration. The inputters worked five-day weeks. We paid 3,000 CFA per person per day for the short-term work of the PTS. We paid 5,000 CFA per day to the Supervisor, who set up the data input formats, supervised the inputters, worked with us to clean up the data, and can use Ariel Plus (Ariel+) for data analysis.

L. The Software Available for Data Analysis in Niamey

DSCN uses IMPS, a software from the U.S. Census Bureau, to input survey data. It uses Ariel Plus (Ariel+) to analyze the data from UNDP household surveys. We could not find an institution that knows or uses Ariel+ in the U.S.A.; we used SAS to analyze the PTS data and therefore cannot evaluate the utility of Ariel+ for data analysis. Macro International used SPSS and evidently did its own analyses of the DHS data. The Director of DSCN said that there are three people there, including himself, who are capable of using SPSS. However, we worked with one of the others who said that his own ability is minimal. We cannot evaluate the ability of DSCN to analyze large databases with SPSS or Ariel+, but UNDP should be able to do so.

MAG/EL uses mainly SP6, a software program from CILSS, for data analysis. SP6 is limited in both the amount of data and the number of cases that it can handle. It is used mainly to make cross-tabulation tables and can manipulate only 200-300 questionnaires with up to 20 variables each. MAG/EL also uses Excel, QuattroPro, Paradox, and Access. INRAN uses SPSS and SAS, both of which can handle large databases and complex statistical analyses.

M. Limitation by Paper Size

The format of the tables in the 1995 questionnaire was limited because only letter-size paper was available in Niamey. Legal-size paper was not available locally and although the photocopy shops reported that they could arrange their machines to make legal-size copies, we did not test the system. All of DSCN's questionnaires are done on European A-4 letter-size paper.

N. Useful Information from the Niger Demographic and Health Survey of 1992

The DHS was conducted by the Direction de la Statistique et des Comptes Nationaux, Direction Générale du Plan, Ministère des Finances et du Plan. The data were collected by the DSCN, in collaboration with the Ministry of Public Health; the Ministry of Social Development, Population, and the Promotion of Women; and Macro International. In addition to USAID, UNDP and FNUAP contributed material and financial assistance. One objective of the DHS was to develop Niger's national capacity to conduct national surveys.

N1. Management

The DHS was managed by a National Director, a Technical Director, and an expatriate Technical Coordinator. Nigerien consultants translated the questionnaire into Hausa and Zarma, and trained the enumerators to administer it in these two languages. The expatriate Technical Coordinator was responsible for training supervisors and enquêteurs, and for coordinating the computer work. He also provided technical assistance in sample design, questionnaire design, personnel training, and data management and analysis. Macro International also provided a sampling expert, two trainers, and two data management people.

N2. The Survey Personnel

A total of 24 people were trained as enumerators and conducted the pre-test of the DHS (twenty people from 16 different arrondissements and four DSCN staff.) There were 21 days of training; the pretest was done in one quartier of Niamey and four rural villages. A technical team selected by the DSCN supervised the fieldwork (an epidemiologist from the Ministry of Public Health; a sociologist from the Ministry of Social Development; statisticians and demographers from DSCN, and a consultant demographer.)

Sixteen team leaders and controllers were selected from the group of enumerators who had done the pre-test survey. In addition, thirty-three female enumerators were chosen, based on training results and aptitude tests. These women received one month of training in interviewing and data recording techniques and completing the DHS questionnaire. The Centre de Formation des Cadres de l'Alphabétisation provided the training in administering the questionnaires in Hausa and Zarma.

N3. Sample Design

The sample was based on the 1988 census, excluding the departments of Agadez, the zone of Arlit, and the arrondissement of Bilma, that contain less than 1% of the population. There are 4,479 census zones (*zones de dénombrement*) from the 1988 census that served as the sampling base for the DHS. Good maps of the boundaries of each census zone exist.

The target sample was 6,000 women of child-bearing age (15-49 years.) The national sample consisted of three strata: Niamey, secondary urban centers, and rural. A total of 235 clusters, which constituted the primary sampling units, were drawn from the 4,479 census zones constructed for Niger's 1988 census. The clusters were drawn systematically from each strata, with a probability proportional to the size of the census zone. DSCN personnel and others who had participated in the 1988 re-census of each cluster in order to produce an accurate list of the households in each cluster. A sample of 10-45 households was selected from the new lists. A total of 5,500 households were identified and a total of 5,242 were interviewed, which is a

response rate of 95%. The survey sample consisted of 309 households in Niamey, 529 in secondary urban centers, and 4,404 from rural areas.

N4. Data Management

The "Integrated System for Survey Analysis," developed by Macro International, was used to input the data. The data input was done at DSCN by six people who received the same training as the enumerators, in addition to computer training. SPSS was used to analyze the data.

N5. Socioeconomic Information Collected

The DHS collected three categories of information that potentially are to S.O.3:

1. Household demographic information: sex of household head; number of household members; age, educational level, and literacy of household member.

2. The nutritional status of women and children under five years of age. This can be used as an indication of economic status, and could be linked with agricultural production.

3. The survey population is characterized in terms of housing (electricity, source of water, type of toilet, flooring, roofing, and the number of rooms used for sleeping) and the material possessions owned (radio, television, refrigerator, bicycle, motorcycle, and car.)

The DHS Timetable

TASK	NO. of MONTHS
1. Entire DHS, from the beginning to the production of the final report.	30
2. Conception of the survey; design and translation of the questionnaire.	3
3. Sample design and definition of the census zones.	2
4. Re-census to draw the sample.	4
5. Pretest the survey questionnaire.	2
6. Finalize the questionnaire.	1
7. Prepare the tabulation and analysis plan.	3
8. Train field workers.	1
9. Conduct the survey.	4

10. Training of computer personnel to input data.	1
11. Data input.	6
12. First draft report.	2
13. Finalize the draft report.	2
14. Preparation of data summary.	1
15. Print report and data summary.	2
16. National seminar.	1
17. Audit.	1

SECTION V
REVIEW OF THE S.O.3 INDICATORS

A. The Context: A Summary of Household Resources and Investments in NRM

The PTS survey was conducted during November 1995, after the rainy season and at the end of the major agricultural season. People were asked about what they did during that past rainy/agricultural season and during the year preceding the survey. Phrases such as “during the past season” and “last year” therefore refer to 1995.

The PTS was a household-level survey, in which “household” was defined as the group of people who work together and share the same granaries. The sampling and analysis unit for the PTS was the concession, which is the extended family that corresponds to this definition of “household.” Most concessions surveyed by the PTS consisted of a man and his wife or wives, their children, and other dependent relatives (widowed sisters, parents, unmarried siblings). A minority of concessions consisted of the families of a father and a married son, or several married brothers. A concession was identified by its head, the “*chef de concession*,” usually but not always a male, who had authority over the household resources, including the use of its fields and other resources for agricultural production and NRM. In approximately 90% of the concessions the *chef de concession* and his first wife were interviewed. In the few cases when the *chef de concession* was elderly, a younger man who was actively involved in managing the concession’s field activities was interviewed. In the few cases when a first wife was not available, another adult woman of the household was interviewed.

The survey sample consists of 135 concessions in 18 villages. One hundred and thirty-five concessions heads were interviewed and 134 women were interviewed. The sample was purposively designed to survey: 1) Haussa, Zarma, and agropastoralist concessions; 2) concessions in three different geographical areas and agricultural production systems; and 3) villages that currently are working with NRM projects (nine “project villages”) and villages that are not (nine “non-project villages”). The terms “project villages” and “non-project villages” are used to refer to this stratification in the following discussion. Sixty-six concessions in project villages and 69 concessions in non-project villages were surveyed. The “household heads” referenced below are the 134 men and one woman; the first wives are referenced below as the “women.” Responses from the household heads effectively represent the men’s responses, as 99% of the household heads are men.

It must be noted that, as with all one-time surveys, the survey data are self-reported, unverified data. We present the data as such and recognize the limitations on accuracy that they are likely to have. The percentages and quantitative data generated by the PTS should be used carefully for policy and programming activities. The interviewees are likely to have under-reported information, which means that the data present a conservative view of the S.O.3 indicators. We estimate that approximately 95% of the men interviewed were the concession heads and approximately 90% of the women interviewed were their first wives. The rest of the men and women surveyed were appropriate substitutes for these social roles, in the few cases when the male concession heads or their first wives were inappropriate to interview due to factors such as inactivity or absence.

A1. Household Resources: Education, Labor, Land, and Livestock

The great majority of the people surveyed are uneducated and illiterate. Ninety-four percent of the household heads, 96% of the women, and 91% of all household members have no education in the francophone public schools. Functional literacy in local languages also is rare. Seventy-seven percent of the household heads, 96% of the women, and 93% of all the household members are illiterate (Tables 2 and 3).

The average number of household members is nine. The dependency ratio for all households is .8; it is .8 for the households in the project villages and .7 for those in the non-project villages (Table 4). (The dependency ratio is the ratio of household members 15 years of age and older to those less than 15 years old.) Thus, for all households, each adult has .8 dependents. In project households each adult supports .8 non-adults and in non-project households each adult supports .7 non-adults.

Most of the household heads surveyed reported that they own land (92%). Owned land was acquired mainly through inheritance and purchase. Most of the fields that household heads cultivated last season were inherited (56% of all fields) and purchased (16%); the fields are mainly dune fields (55%) and valley fields (23%) (Table 21). About half of the household heads own 1-3 fields and about half own 4-17 fields (Table 17). Approximately three-quarters of all households in the sample cultivated 5-8 fields last season (Table 20.) All of the landless household heads reported that they rented fields; about two-thirds of them rented 1-3 fields (Table 18).

Most of all the fields cultivated were collective household fields (87%), which tend to receive more management and inputs than individual fields. One-third of the household heads reported leaving some of their fields fallow last season. The major crops that they cultivated were millet (31% of all crops in all fields), sorghum (20%), and cowpeas (20%) (Table 22).

Women have access to land by cultivating parcels in their husbands' fields (57% of all the fields cultivated by women), cultivating in their concessions (18%), inheriting land (13%), and cultivating land loaned by relatives (6%) (Table 23). One-quarter of the women surveyed reported that they own fields that they inherited or were given to them by their husbands. Most landed women (69%) own only one field (Table 19). The fields that the women cultivated last season were mainly dune fields (50%) and hardpan (17%). The major crops that women cultivated were cowpeas, millet, okra, sorghum, peanuts, *fonio*, and sesame (Table 24). Fourteen women in the sample (11%) did not cultivate any fields last season.

The patterns of livestock ownership are much the same in project and non-project villages. Half of all households own cattle, 80% own goats, 62% own sheep, and 34% own donkeys. Oxen are used as traction animals; 48% of households in project villages own oxen, and 36% of households in non-project villages own them (Table 11).

A2. Household Sources of Cash Income

Households' major sources of cash income are the sale of animals or animal products (31% of all sources), weaving mats (29%), selling food (27%) and sales of agricultural products (peanuts 23%, sesame 20%, cowpeas 16%, rice 14%, *souchet* 14%, onions 11%, okra 11%, and garden vegetables 8%) (Table 9). Fattening livestock to sell (19%) and commerce (18%) also

generate cash income. Artisanry, daily wage labor, seasonal migration and cash remittances from family members typically are secondary sources of cash income for all households (Table 9).

The sale of food, transformation of agricultural products, and sales of onions, vegetables, and okra are reported as more important sources of income in households in project villages (Table 9). The sale of animals or animal products, artisanry, and daily wage labor are reported as more important in non-project village households than in project villages.

A3. People's Perceptions of What They Need to Improve Agricultural Production

Rural Nigeriens perceptions of what they need to improve their agricultural production and what they invest in NRM provide the background for discussing their use of NRM technology. Chemical fertilizer, traction animals, and money are first in the list of what is needed to improve their production. Plows, improved seed, pesticides, carts, agricultural equipment, and good rains are next on the list (Table 25). Fertilizer clearly is perceived as the primary need by both men and women; after that, the household heads report needing equipment (traction animals, plows, hand tools/equipment), and women list money and inputs (improved seed and pesticides). Except for the modern inputs, NRM technologies (such as striation or *scarification*, soil management, tree plantations, or mulching) are cited by very few people.

A4. Expenditures on Modern Agricultural Inputs and Labor for NRM

Eighty-seven percent of all households reported that they purchased modern agricultural inputs (chemical fertilizer, improved seed, and pesticides) during the past season. Nobody reported purchasing or using herbicides; many people apparently do not know about them. The largest proportion of households (41%) spent a total of 1-5,000 CFA on the inputs (Table 28). Expenditures on fertilizer were more than on improved seed or pesticides (Table 27). Higher proportions of households in project villages bought inputs than in non-project villages. In the project villages, 71% percent of the households purchased fertilizer last season, 53% purchased improved seed, and 82% purchased pesticides (Table 27). In non-project villages, 48% of households bought fertilizer, 23% bought improved seed, and 67% bought pesticides.

Approximately one-third of all households reported that they had hired labor to help them implement the NRM technology that they used in their agricultural fields during the past season. All of the labor was paid for in cash; three-quarters of the households spent 1-10,000 CFA for labor (Table 26). Some women reported paying for labor in both cash and kind. There is little difference between project and non-project villages in hiring and expenditures for this labor.

A5. The Use of Credit for NRM and Agricultural Production

About two-thirds of all households obtained credit in cash during the year before the survey. There is little difference between project and non-project households' access to cash credit, but there is a difference in their sources of the credit. Projects provide 27% of all cash credits in project villages; they provide no credit in non-project villages (Table 12). Private individuals and merchants are the sources of 77% of all cash credit in non-project villages; they provide 59% in project villages. Cash credit for agricultural inputs and production represent only 11% of all the cash credits obtained by household heads and women (Table 13). People's major cash investments in NRM are to purchase modern inputs and to hire labor. The data tabulations show some differences between men's and women's allocations of cash to NRM, but little

difference between the villages with NRM projects and those without them (Table 13). Over half of all households (57%) obtained 1-20,000 CFA of credit in cash (Table 14).

Almost half of all households obtained credit in kind specifically for NRM or agricultural production. Projects also make a significant difference in access to this type of credit: they are the major source for households in project villages, providing 49% of all such credit; no households in non-project villages report this source of credit in kind (Table 15). Private individuals are the second source of credit in kind for NRM in project villages (34%) and virtually the only source in non-project villages (98% provided by private individuals and merchants.) All the households that obtained credit in kind for NRM or agriculture used it to purchase food, modern inputs, consumer goods, and livestock. Households in project villages purchased more inputs and livestock and less food with their credit than those in non-project villages (Table 15). The value of most households' credit in kind was reported as 1-10,000 CFA (Table 16.)

Evidently people invest little cash credit in NRM or agricultural production. Projects that provide credit in kind enable people to invest in inputs and livestock. It is interesting that buying food is reported as a primary objective of credit in both cash and kind, and that people consider buying food with credit in kind as using the credit for NRM or agriculture (Table 15). As some respondents said, one must eat in order to be able to work the fields.

B. Reporting on the S.O.3 Indicators in 1995

S.O.3 plans to monitor six PMP indicators by conducting national-level surveys every four years. The National Baseline Survey will be done in 1996. The data from the 1995 PTS in this report thus provide pre-baseline assessments of S.O.3's PMP indicators in three regions of Niger. This section discusses each of those six indicators in turn. We have used our own judgement to identify "new" NRM techniques.

B1. Percent of Heads of Households, Both Men and Women, Reporting the Use of One or More New NRM Technologies

All the NRM techniques that household heads and women report that they currently use are listed in Tables 30 and 41 respectively, in Annex II. The techniques that we have chosen as "new" and the proportion of people who report using them are in Table V-1 below. The new techniques used by many people include improved tree trimming, pesticides, the protection of natural regeneration, chemical fertilizer, mulching, livestock corridors, and using animal traction to cultivate. The new techniques that very few people reported using (2% or less) are not listed in Table V-1; they can be found in Tables 30 and 41.

There are some interesting differences between the NRM techniques used by people in the project and non-project villages. The first two pages of Table 30 show that, overall, higher proportions of the household heads in the project villages are using all types of techniques. The differences between project and non-project household heads' use of techniques that can be considered "new" and their use of traditional techniques are summarized in Table V-2 below. The differences in women's use of NRM techniques in project/non-project villages is less consistent (Table 41.) However, higher proportions of the women in project villages clearly are using some "new" NRM techniques, as Table V-3 below shows. The PTS data thus indicate that projects are affecting people's NRM behavior, to some extent.

**Table V-1. Indicator One: Household Heads' and Women's Use of
New NRM Techniques
(percent of household heads and women)**

New NRM Techniques	Household Heads	Women
Improved tree trimming	71	52
Pesticides	61	57
Protect natural regeneration	44	47
Chemical fertilizer	49	47
Mulching	44	11
Livestock corridors	36	41
Animal traction to cultivate	36	19
Control tree cutting	30	23
Micro check dam (micro-barrage)	20	13
Improved seed	26	37
Demi-lune for agriculture	13	7
Demi-lune for forestry	16	13
Land reserved for pasture	22	28
Windbreak	19	5
Seedling nursery	13	18
Irrigation with motor pump	11	10
Zai (tassa)	11	8
Dike (muret)	12	10
Prohibit burning the bush	4	16
Protect territory (mise en defens)	4	6
Improved cook stove	2	34

**Table V-2. Household Heads: Differences in NRM Techniques Used
in Project/Non-Project Villages
(percent of household heads)**

NRM Techniques	Houshold Heads, Project Villages	Household Heads, Non-Project Villages
<u>New techniques:</u>		
Pesticides	67	55
Micro check dam (micro-barrage)	27	13
Demi-lune for agriculture	27	0
Demi-lune for forestry	27	4
Massive rock dike (muret)	24	0
Windbreak	27	10
Seedling nursery	26	0
Zai (tassa)	20	3
<u>Traditional techniques:</u>		
Picket livestock in field for manure (parcage)	18	35
Small rock dike (cordon en pierre)	26	12
Transhumance	12	23
Burning	12	19
Traditional tree trimming	3	19

**Table V-3. Women: Differences in New NRM Techniques Used
in Project/Non-Project Villages
(percent of women)**

New NRM Techniques	Women, Project Villages	Women, Non-Project Villages
Plant trees	74	59
Pesticides	64	50
Protect natural regeneration	52	41
Fertilizer	62	32
Improved seed	50	28
Improved cookstove	39	28
Earthen dike (diguette)	32	12
Control tree cutting	29	18
Demi-lune for forestry	24	2
Seedling nursery	35	2
Demi-lune for agriculture	14	0
Zai (tassa)	14	2

B2. Percent of Heads of Households, Both Men and Women, Aware of the Rural Code

Forty-five percent of all the people surveyed have heard about Niger's new Rural Code. Half of the household heads and women in the project villages and 39% in non-project villages knew about it (Table 10, Annex II). A higher percentage of people were aware of the Rural Code's major themes, even if they had not heard of the Rural Code as such. Eighty-nine percent had heard about the need for rapport between farmers and pastoralists, 52% had heard about rural people's land tenure rights, and 78% had heard about resolving land tenure conflicts. These figures are virtually the same in both project and non-project villages (Table 10). People's major sources of information about the Rural Code and its themes were the radio (73% of all responses), other villagers (69%), village chiefs (45%), canton chiefs (14%), and GON agents (19%).

B3. Percent of Heads of Households, Both Men and Women, Able to Identify at Least One New NRM Method

People were asked about the NRM techniques that they know of but do not use in order to address this indicator. The complete lists of the techniques known but not used are in Table 53 (household heads) and Table 59 (women) in Annex II. Table V-4 below lists the techniques that can be considered new that many people reported knowing; it does not include those cited by 2% or less of the respondents, which are in Tables 53 and 59.

As Table V-4 shows, quite a large proportion of household heads and women know about modern inputs although they do not use them. They also can identify various techniques for soil and water conservation: different types of dikes (permeable rock dikes and *murets*, a project-specific type of massive dike), micro check dams, demi-lunes, mulching, *zais*, cut-off ditches perpendicular to the slope, planting trees, and windbreaks.

**Table V-4. Indicator Three: Household Heads and Women,
New NRM Techniques Known, But Not Used
(percent of household heads and women)**

New NRM Techniques	Household Heads	Women
Chemical fertilizer	39	49
Land reserved for pasture	25	28
Improved seed	24	25
Pesticides	23	38
Tube wells	15	35
Animal traction for cultivation	14	8
Zai (tassa)	13	8
Micro check dam (micro-barrage)	9	19
Permeable rock dike (mini-barrage filtrant)	10	5
Mulching	9	10
Plant trees	9	8
Windbreak	7	7
Demi-lune for forestry	7	2
Live fencing	7	2
Check dam (barrage)	7	< 1
Demi-lune for agriculture	6	4
Large rock dike (muret)	8	4
Seedling nursery	5	16
Livestock corridors	4	3
Direct seeding of pasture forage	4	< 1
Ditch perpendicular to the slope	4	8

B4. Percent of Heads of Households, Both Men and Women, Able to Describe at Least One NRM Practice Used in Another Village

This indicator was operationalized as “people’s source of information about NRM techniques (those they use and those they know about but do not use) is another village” on the survey questionnaire. Household heads reported that “another village” is their major source of information (36% of all sources) about the NRM techniques they know about but do not use. Their other sources of information are tradition (20%) and state technical agents (17%) (Table 54).

Women’s major sources of information about the techniques they know about but do not use are the reverse: tradition is their first source (42% of all sources) and “another village” is their second (21%). State technical agents are women’s other major source of information (14%) (Table 60). These figures indicate that household heads (men) have greater access to outside information than do women, who rely much more on local information. Only 3% of all women reported their husbands as sources of information so we can deduce that, in accordance with another conventional wisdom, little technical information is transferred between spouses.

For men’s and women’s combined responses, “another village” accounts for 26% of all the sources of information about NRM techniques *known but not used* (Table 66). There is a difference between the project and non-project populations with this indicator: “another village” is reported as 33% of all sources of information for techniques known but not used by the people in non-project villages, compared to 19% of all sources by the people in project villages (Table 64). These figures indicate that information about NRM technology does diffuse across villages, so that people do know about techniques used in other villages. Information diffused from project villages becomes a major source of information about NRM for people with fewer sources within their villages, i.e., those without assistance from projects or missionaries.

The other major sources of information for men and women about the NRM techniques they *know about but do not use* are tradition (32% of all sources), state technical agents (18%), and people in their villages (9%) (Table 66). The people’s major sources in project villages are tradition (36% of all sources), state technical agents (12%), missionaries (11%), and current projects (10%).

“Other villages” are minor sources of information for the NRM techniques that people currently *do use*. They account for only 1% of all information sources in project villages and only 4% in non-project villages (Table 52). In project villages, the major sources of information about the techniques people use are tradition (45% of all sources), state technical agents (12%), missionaries (21%), and current projects (13%). In non-project villages, the major sources of information are tradition (61% of all sources) and state technical agents (18%) (Table 52).

“Other villages” account for only 2% of all the sources of information about the techniques that household heads currently use, and for only 3% of all the sources of information about the technique that women use (Tables 33 and 44). Men’s major sources of information about the techniques they use are tradition (49% of all sources), state technical agents (19%), and missionaries (12%). Women’s major sources are tradition (56% of all sources), missionaries (14%), and state technical agents (11%).

B5. Percent of Heads of Households, Both Men and Women, with Access to Market and Climatic Reporting Services (an S.O.2 Indicator)

Approximately one-third of all households own functional radios. Sixty-one percent of all men and women (66% in project villages and 57% in non-project villages) reported that they had heard news of agricultural product prices during the two weeks preceding the survey (Table 10). Eighty-four percent of all people reported that they usually listen to news about the climate during the rainy season (this news is not broadcast during the dry season.) They had heard about regional rainfall and droughts, locust attacks, and the state of maturity of major crops in different regions on the radio (Table 10).

B6. Percent of Heads of Households, Both Men and Women, Reporting Access to Credit (an S.O.2 Indicator)

The PTS collected information about credit in cash and in kind. Information about cash credit is in Tables 12, 13, and 14 in Annex I; information about credit in kind is in Tables 15 and 16. Approximately two-thirds of all households, 70% in project villages and 67% in non-project villages, reported that they had obtained cash credit last year. Many households got cash credit two or three times during the year: 55% in project villages and 35% in non-project villages. Individual credit is by far the most common; only one non-project household reported that it got collective credit, although 19% of the project households did (Table 12). Private individuals and merchants are the sources of 98% of credit in non-project villages. In project villages, private individuals are the major source of credit (55% of all credits) but projects are the second major source, providing 27% (Table 12).

The major uses of cash loans were to pay for traditional ceremonies (20% of all credits), to invest in commerce (16%), to buy food (13%), to fatten livestock (13%), to buy modern agricultural inputs (9%), and to buy clothes (8%) (Table 13). As Table 13 shows, relatively few people invested their cash credit directly in agricultural production or NRM.

The amount of most loans that households obtained ranged from 1,000-45,000 CFA; only 13% of all households obtained more than 45,000 CFA. Household heads (men) got larger loans than women, and more households in project villages got larger loans than those in non-project villages (Table 14). The reimbursement period for 78% of all cash credits is one to six months.

Only information about credit in kind for NRM or agriculture was collected, due to the time limit on survey interviews. Forty-five percent of all households reported that they obtained this type of credit last year (Table 15). The majority of households (72%) obtained this type of credit only once during the past year. The sources of this credit differ between the project and non-project villages. Households in the project villages reported that projects provided 49% of their credits in kind, private individuals and merchants provided 36%, CARE furnished 7%, and CLUSA furnished 7% (Table 15). Households in non-project villages reported that private individuals and merchants provided 98% of their credits in kind; only one household obtained credit from CARE.

The major types of credit in kind in project households were food (34%), modern inputs (27%), livestock (20%), and basic consumer goods (10%) (Table 15). Non-project households got food (50%), modern inputs (13%), and basic consumer goods (13%) (Table 15).

Many respondents could not report the value or the amount of reimbursement in CFA of their credit in kind. Most households in both project and non-project villages (59%) reported reimbursements of 1-10,000 CFA for their credit in kind (Table 16). There is little difference between project and non-project households in the amount of CFA reimbursements for credit in kind (Table 16). The reimbursement period for credit in kind is one to six months (89% of all households), although 17% of project households reported a period of 7-12 months (Table 16).

ANNEX A
RURAL HOUSEHOLDS: SOCIOECONOMIC AND NRM PROFILES

The unit of sampling and analysis for the PTS is the concession, which we define as the group of people who work their collective fields together and eat from the same granary. The concession generally is an extended household consisting of a man and his wife/wives, their children, and in some cases other relatives (a widowed sister, parents, or unmarried siblings). The terms "concession" and "household" therefore are interchangeable in this report. A concession was identified by its head, the "*chef de concession*," usually but not always a male, who had authority over the household resources, including the use of its fields and other resources for agricultural production and NRM. In approximately 90% of the concessions surveyed the *chef de concession* and his first wife were interviewed. In the few cases when the *chef de concession* was elderly, a younger man who was actively involved in managing the concession's field activities was interviewed. In the few cases when a first wife was not available, another adult woman of the household was interviewed. A total of 135 concession heads were interviewed, only one of which was a woman. The "household heads" referenced in the discussion below thus effectively represent men's responses. A total of 134 women were interviewed.

The survey sample consists of 135 concessions in 18 villages. The sample was purposively designed to survey: 1) Hausa, Zarma, and agropastoralist concessions; 2) concessions in three different geographical areas and agricultural production systems; and 3) villages that currently are working with NRM projects ("project villages") and villages that are not ("non-project villages"). Sixty-six concessions were surveyed in project villages and 69 concessions were surveyed in non-project villages.

It must be noted that, as with all one-time surveys, the survey data are self-reported, unverified data. We present the data as such and recognize the limitations on accuracy that they are likely to have. The percentages and quantitative data generated by the PTS should be used carefully for policy and programming activities. As a pilot survey the PTS was limited to 18 villages in three regions of Niger, so the data are not representative of the entire country. The probable bias is under-reporting of information, which means that the data present a conservative picture. We estimate that approximately 95% of the men interviewed were the concession heads and approximately 90% of the women interviewed were their first wives. The rest were appropriate substitutes for these social roles, in the few cases when the male concession heads or their first wives were inappropriate to interview due to factors such as inactivity or absence.

The PTS survey was conducted during November 1995, after the rainy season and at the end of the major agricultural season. People were asked about what they did during that past rainy/agricultural season and during the year preceding the survey. Phrases such as "during the past season" and "last year" therefore refer to 1995.

A. The Need for Secondary Statistical Analysis

The 1995 Pre-Test Survey produced three separate but related databases: one for men, one for women, and one for villages. These databases have great potential for statistical analysis that could increase the S.O.3 team's understanding of NRM-related behavior. The relationships

between key variables indicated in the tables above, such as between gender and the use of NRM technology or between residence in project villages and access to credit, could be determined with statistical tests. Key variables and the relationships between them also could be explored in terms of the different populations of interest in the survey sample: men, women, and households; project or non-project men, women, and households; agriculturalists or agropastoralists; and the three different agricultural systems surveyed. The PTS databases thus provide the basis for increased understanding of the socioeconomic and agricultural characteristics of the people who use (or know about) more NRM technology and of those who use (or know about) less. Statistical analyses would provide more information for S.O.3 and also identify the topics that require focused studies.

B. Ethnicity and Village Residence

There are 135 household heads in the PTS sample, one of which is a woman. The ethnic composition of the household heads reflects the sampling strategy: 53% Haussa, 24% Zarma, 11% Peulh, and 12% Touareg (Table B.1.). We asked men and women their length of residence in the villages we surveyed because it is a factor that may affect NRM; 99% of the household heads had lived in their villages more than 10 years (Table B.1.).

C. Household Resources

C1. Education and Literacy

Education and literacy are very limited among household heads (Table B.2.). Ninety-four percent of all household heads have not attended the public, francophone schools and 77% are illiterate. Thirteen percent of the men are literate in Arabic, 7% in Haussa, and 2% in Zarma. The figures for women are similar: 96% have not attended public school and 96% are illiterate. Women reported being literate only in Arabic (2%) and Haussa (2%). At the concession level, with data from children, the rates are essentially the same: 91% of all concession members have not attended public schools and 93% are illiterate. The implications of these figures, in terms of transferring NRM technology to rural households, is sobering.

C2. Access to Information

Approximately one-third of all households own radios. Almost two-thirds of the people surveyed reported that they had heard news about agricultural product prices during the two weeks preceding the survey, and 84% reported that they usually listen to news about the climate during the rainy season (Table B.10.). These households had heard news about the rains, locust attacks, the stages of development of different crops in different regions, and the lack of rain in different regions.

Forty-five percent of all men and women knew about the new Rural Code; 50% in project villages and 39% in non-project villages (Table B.10.). Many people did not know about the Rural Code as such, but they knew about its major themes: rapport and the need for rapport between farmers and herders (89% of all men and women), rural peoples' land tenure rights (52%), and the resolution of land tenure conflicts (78%). The only difference between project and non-project villages in these variables is that fewer people in the latter know about the Rural Code. Fewer women report knowledge of these variables than do men (Table B.10.).

About three-quarters of all men and women learned about the Rural Code and its themes from the radio. Their other sources of information are their fellow villagers (69% of all sources), village chiefs (45%), state agents (19%), and canton chiefs (14%). Thus, more men and women learned about the Rural Code from the radio than from any other single source, but twice as many learned about it from contact with other people rather than from the media. Given people's high rates of illiteracy and the constraints on providing regular TA in Niger's rural villages, these data suggest that radio broadcasts, farmer-to-farmer programs, and visits to other villages may be three practical means of disseminating knowledge about NRM to rural people.

C3. Labor Resources: Household Demographic Composition

The number of people in the households surveyed ranges from two to 30, with an average of nine. Most households have 2-6 members (30% of all households) or 7-10 members (46%); only one-quarter have 11 or more members (Table B.4.). The dependency ratio (the ratio of household members 15 years of age and older to those less than 15 years old) is .8 for all households (Table B.4.). The dependency ratio in the households in project villages is .8, so that each adult in these households supports .8 children. The ratio in non-project households is .7. This difference probably is due to the small size of the sample, but it does mean that the men and women in non-project villages have slightly more dependents to support.

C4. Economic Activities and Cash Income

C4a. Household Economic Systems

Rural Nigerien households of course are economic generalists and therefore their economic systems consist of several activities. Three-quarters of all households reported having 2-3 major activities in their economic systems and 20% have 4-6 (Table B.6.). Table B.7. shows the economic activities that households report as having primary, secondary, and tertiary importance in their economic systems. Households reported four primary economic activities: rainfed agriculture, animal husbandry, artisanry, and rice production. Table A.1. below shows that, overall, households' economic systems are quite similar in project and non-project villages.

Rainfed agriculture is the primary activity for 96% of all households and animal husbandry is primary for 2% of households (Table B.7.). Households' principal secondary activities are animal husbandry, commerce, and seasonal migration or *exode*. Their principal tertiary activities are animal husbandry and commerce, artisanry, fattening livestock (*embouche*), and *exode*. The typical household's economic system thus consists of rainfed agriculture as its primary activity; livestock production including *embouche*, commerce, or seasonal migration as its secondary activities; and livestock production plus *embouche*, commerce, artisanry, *exode*, or vegetable production as its tertiary activities (Table B.7.) Seasonal migration is a major secondary activity only in Tahoua (Table B.7.). Two-thirds of all households reported that none of their members went on seasonal migration last year; one member did so in 20% of all households (Table B.5.). There is no real difference between the project and non-project villages in this variable (Table B.5.).

C4b. Sources of Cash Income

The PTS data illustrate the well-known fact that agricultural and livestock production generate most income in Niger (Table B.9.). Households reported that their major sources of cash income are the sale of: animals or animal products (37% of all households); food (22%);

and a variety of crops including peanuts, sesame, cowpeas, rice, souchet, and onions. Other major sources of cash income are selling woven mats (20% of all households) and commerce (23%). Household income from non-agricultural sectors includes artisanry (9%) and cash remittances from household members outside the villages (8%).

Women's sources of cash income are shown in Table B.8. in Annex B. Their major sources of cash income are the sale of: animals or animal products (25% of all women), food (33%), and woven mats (37%). Twenty-one percent of the women generate cash by fattening livestock and 16% by transforming agricultural products.

Table A.1. Summary of Households' Primary, Secondary, and Tertiary Economic Activities (percent of activities; based on Table B.7. in Annex B)

Activities	Sample	Project Villages	Non-Project Villages
Primary activity: Rainfed agriculture	96	97	96
Secondary activities: Livestock, including embouche	44	34	54
Commerce	16	20	11
Exode	12	11	14
Vegetable production	5	8	3
Artisanry	2	2	2
Tertiary activities: Livestock, including embouche	32	37	24
Commerce	19	14	24
Exode	10	14	5
Vegetable production	8	8	3
Artisanry	15	9	22

C5. Access to Credit

C5a. Cash Credit

Approximately two-thirds of all households obtained credit in cash last year (either the male interviewee or the female interviewee or both in the household reported obtaining credit). Half of all these households received credit once and half received it 2-6 times. Cash credit was obtained mainly in the form of individual credit (89% of all loans) rather than collective credit (Table B.12.). The major sources of credit for all households are private individuals and merchants (73% of all loans) and projects (15%). More households in project villages received a few loans (2-3) and more of their credit was collective (19% of all loans). Only one non-project household received collective credit. There also is a difference between the project and non-project villages in terms of their sources of credit. Private individuals and merchants provided 59% of all cash

loans in project villages; projects and CARE provided 33%. In non-project villages, those figures are 98% and 0, respectively (Table B.12.).

Table A.2. below shows the principal uses of people's cash credit and the differences between project and non-project villages. The major difference is that people in project villages invested their credit in the potentially remunerative activity of fattening livestock for sale rather than in food. Table A.3. below compares people's investments of cash credit in activities related to agricultural production and NRM. It shows that very few people used their cash credit directly for agriculture or NRM and that there is no real difference between the project and non-project villages.

The amount of cash credit that most 87% of the people obtained ranged from 1,000 to 45,000 CFA (Table B.14.). People in the project villages generally got larger loans: 30% of their loans were 1,000-10,000 CFA, and 55% were 10,001-45,000 CFA. In the project villages the figures for those same two categories were 59% and 29% respectively. Women generally got smaller loans than the household heads: 75% of all women's loans were 1,000-10,000 CFA and only 2% of all women received loans of more than 30,000 CFA, whereas 27% of the household heads received loans in the latter category (Table B.14.).

**Table A.2. Principal Uses of Cash Credit in Project and Non-Project Villages
(percent of all loans)**

Principal Uses of Cash Credit			
Project Villages		Non-Project Villages	
1. Fatten livestock	21%	1. Food	21%
2. Traditional ceremonies	20%	2. Traditional ceremonies	19%
3. Commerce	17%	3. Commerce	16%
4. Modern inputs (fertilizer, improved seed, pesticides)	8%	4. Clothes	11%
5. Food	6%	5. Modern inputs	9%

Table A.3. Investment of Cash Credit in Agricultural Production and NRM in Project and Non-Project Villages (percent of all loans)

Use of Cash Credit	Project Villages	Non-Project Villages
Modern inputs (fertilizer, pesticides, improved seed)	8	9
Agricultural production	2	one loan
Manure	0	one loan
Local Seed	one loan	0
Seedling nursery	0	one loan
Hire labor	one loan	0
Agricultural equipment	0	one loan

Table A.4. Comparison of Household Heads' and Women's Uses of Cash Credit (percent of all men's and women's loans)

Principal Uses of Cash Credit			
Household Heads		Women	
1. Food	23%	1. Traditional ceremonies	25%
2. Modern inputs	21%	2. Livestock fattening	19%
3. Commerce	12%	3. Commerce	19%
4. Traditional ceremonies	11%	4. Clothes	12%
5. Agricultural production	5%	5. Food	8%

C5b. Credit in Kind for Agriculture and NRM

The PTS asked people about credit in kind that was used for agriculture and NRM, due to the time limit for the survey interviews. This information is summarized in Tables B.15. and B.16. in Annex B. Forty-five percent of all households obtained credit in kind for agriculture or NRM last year (Table B.15.). Approximately three-quarters of all these households received only one loan. The major sources of credit in kind are private individuals, projects, CARE, and CLUSA. As with cash credit, there is a difference between project and non-project villages in their sources of credit. In project villages, private individuals and merchants provide 36% of all credit, projects provide 49%, and CARE and CLUSA provide 7% each (Table B.15.). In non-

project villages, private individuals and merchants provide virtually all their credit in kind, 98%. Only one non-project household obtained credit from CARE.

As Table A.5. below shows, the household heads and women in project villages got considerably more credit in kind as modern inputs and livestock than did those in non-project villages. The people in non-project villages got more credit in kind as food.

Some people were not sure of the amount in CFA that they would reimburse for their credit in kind. Three-quarters reported that their reimbursement would be 1,000-20,000 CFA (Table B.16.). The data show that the value of credit in kind, based on reimbursement amounts, is the same in both project and non-project villages.

**Table A.5. Use of Credit in Kind in Project and Non-Project Villages
(percent of all loans)**

Use of Credit in Kind	Project Villages	Non-Project Villages
Food	34	50
Modern inputs	27	13
Livestock	20	one loan
Hire labor	0	4
Local seed	2	4

Thirty percent of all household heads and 22% of women obtained credit in kind for agriculture or NRM (Table B.15.). More women than men received credit more than once, 54% and 29% respectively. Women obtained their credit mainly from private individuals and merchants (74% of all loans) and projects (18%); household heads obtained theirs from private individuals (65%) and projects (27%).

The principal uses of household heads' and women's credit in kind is summarized in Table A.6. below. Household heads' credit was mainly in the form of food (55% of all loans) and modern inputs; women's was in the form of food (26%), modern inputs (13%), and livestock (13%). There is a difference in the value of men's and women's credit in kind, based on the amount of CFA they reported as reimbursable. Eighty-two percent of all women's loans were 1,000-10,000 CFA and only one woman received a loan of more than 30,000 CFA (Table B.16.). Only 51% of all men's loans were 1,000-10,000 CFA and 12% of their loans were more than 30,000 CFA. Thus, as with cash credit, men have access to higher values of credit in kind than do women.

**Table A.6. Household Heads' and Women's Use of Credit in Kind
(percent of all household heads' and women's loans)**

Use of Credit in Kind	Household Heads	Women
Food	55	26
Modern inputs	25	13
Livestock	8	13
Basic consumer goods	one loan	24
Local seed	0	8

C6. Livestock

Camels and horses are the two types of livestock that very few households own, 7% and 3% respectively. Half of all households own cattle, 80% own goats, 62% own sheep, and 34% own donkeys (Table B.11.). There is little difference between project and non-project households in terms of livestock ownership. Oxen, used for animal traction, are owned by 48% of all project households and 36% of all non-project households.

C7. Land Ownership

C7a. What People Need to Improve Their Production

The survey included a question that asked people what three things they most needed to improve their agricultural production, in order to have some insight into farmers' perceptions of this key topic. The information is summarized in Table B.25. in Annex B. The most frequent responses from all people were chemical fertilizer (23% of all responses), traction animals (10%), money (10%), plows (9%), improved seed (9%), and pesticides (7%). There is little difference in these responses between the project and non-project villages. The needs reported by household heads and women differ somewhat. More household heads reported that they need traction animals and agricultural equipment; more women reported that they need money, improved seed, and pesticides.

C7b. Household Heads: Land Ownership and Use

Tables B.17.-B.24. in Annex B contain the information about the land that people own and the crops that they produced in 1995.

Ninety-two percent of all household heads reported that they own land, 94% in project villages and 90% in non-project villages. The household heads in the project villages evidently own more land: 52% own 4-7 fields and 10% own 8-17 fields. In the non-project villages, 44% own 4-7 fields and none own more than seven (Table B.17.). All of the household heads reported

that they have the right to plant fruit trees and dig wells in their fields, which indicates that their ownership is secure.

The number of fields cultivated in the 1995 agricultural season differs between the project and non-project household heads, as Table A.7. shows. About 70% of the household heads in both types of villages cultivate 1-3 fields. However, 50% of those in non-project villages cultivate only 1-2 fields, whereas 71% of those in project villages cultivate three or more fields.

**Table A.7. Household Heads: Number of Owned Fields Cultivated in 1995
(percent of landed household heads)**

Number of Owned Fields Cultivated	Project Villages	Non-Project Villages
1-2	29	50
3	39	19
4-6	26	29
7-9	three men	one man

The household heads in both types of villages left some of their land fallow last season: 44% of those in project villages and 21% in non-project villages (Table B.17.). In the project villages, of those who practiced fallowing, approximately two-thirds left one of their fields fallow and another one-third left 2-4 fields fallow. In the non-project villages, among those who practiced fallowing, 92% of the household heads left only one field fallow.

Some of the landed household heads rented out some of their fields and rented-in additional fields. One-quarter of all household heads rented out some of their own fields; of these, 45% rented out one field, and 32% rented out two fields (Table B.17.). These figures differ little between the project and non-project villages. Twenty-nine percent of all household heads rented-in additional fields in 1995. Of these household heads, most of those in project villages (71%) rented-in only one field and 18% rented-in two fields. Of the renters in non-project villages, 47% rented-in one field and 47% rented-in two fields. The data thus indicate that the household heads in non-project villages own fewer fields, less of them can leave their fields fallow, and they rent-in more fields.

Only 8% of all the household heads surveyed reported that they do not own land, 6% in project villages and 10% in non-project villages (Table B.18.). All of them reported renting-in fields last season.

The total number of fields controlled and cultivated at the household level is summarized in Table A.8. below. The largest proportion of households controlled a total of 3-7 fields: 69% of households in project villages and 73% in non-project villages. Approximately half of the project households (54%) cultivated a total of 6-7 fields last season and approximately one-third cultivated 8-14 fields. The corresponding figures for non-project households are 42% and 49%.

**Table A.8. Land Controlled and Cultivated by Households Last Season
(percent of households)**

Total Number of Fields	Project Villages	Non-Project Villages
Number controlled by* households last season:		
1-2	26	9
3-4	41	37
5-7	28	36
8-18	6	19
Total number cultivated:**	one household	
3		0
5	10	9
6-7	54	42
8	16	24
9-14	19	25

* Total of: men's fields owned, women's fields owned, and the fields rented-in.

** Total of: men's fields cultivated, fields rented-in, women's collective fields cultivated, women's collective gardens cultivated, and women's other fields cultivated.

For all household heads, 56% of the fields they cultivated last season were inherited fields and 16% were purchased. Project household heads reported that 64% of their cultivated fields were inherited and 14% had been purchased; non-project household heads reported figures of 49% and 17% respectively (Table B.21.). The other means of acquiring the fields cultivated last season were reported as, in order of descending frequency, loaned by relatives, clearing ("right of the axe"), given by a relative, loaned by a non-relative, inherited through the right to cultivate the field, given by a non-relative, sharecropped, and allocated by the state (such as irrigated perimeters). Household heads reported that 87% of all the fields cultivated were collective household fields.

Seven different types of fields were cultivated (Table B.21.). The major types were dune fields (55% of all fields cultivated) and valley fields (23%). Plateau and hardpan (*glacis*) fields each account for 7% of all fields; lowlands (*bas fonds*) account for 6%, *dallols* for 2%, and irrigated perimeters for less than 1%.

The crops cultivated in these fields are listed in Table B.22. in Annex B. The major crops in household heads' fields were millet (31% of all crops), sorghum (20%), and cowpeas (20%). The cash crops included peanuts, sesame, souchet, okra, and vegetables.

C7c. Women: Land Ownership and Use

One-quarter of all women reported that they own land, 26% in project villages and 22% in non-project villages (Table B.19.). All the landowners reported that they have the right to plant fruit trees and to dig wells, but 12% of the project women reported that their husbands can reclaim the fields, which indicates that their ownership is questionable. None of the non-project women reported this. All the women own 1-2 fields except one woman who owns three. Most women own only one field: 65% in project villages and 73% in non-project villages.

Approximately three-quarters of all women cultivated parcels in their husbands' fields last season. The majority of these women (88%) cultivated 1-2 such parcels (Table B.19.). About one-quarter of the women cultivated in their concessions, which generally consists of some vegetables and herbs. Only 10% of all the women interviewed reported that they cultivated in women's collective fields or gardens (Table B.19.). Women's access to land thus is mainly through cultivating their husbands' land.

Women cultivated mainly dune fields (50% of all their fields) and hardpan (*glacis*) fields (17%). The complete list of the crops that they cultivated is in Table B.24. in Annex B. Women's major crops were cowpeas (16% of all crops), millet (16%), okra (15%), sorghum 14%, peanuts (10%), *fonio* (10%), and sesame (9%).

The PTS data illustrate the conventional wisdom that women's access to land in Niger is limited. The major differences between household heads' (men's) and women's ownership and use of land is summarized in Table A.9. Fewer women than men own land, 24% versus 92% respectively. All the women surveyed own 1-3 fields, whereas 53% of the men surveyed own four fields or more. Women have access to land mainly through "loans" from their spouses: cultivating part of a spouse's field accounts for 57% of all the women's fields cultivated last season. Inheritance accounts for access to 13% of all women's fields. A larger proportion of women's fields also are poor quality soil: 17% of their fields last season were hardpan (*glacis*), versus only 7% of men's fields. Whether or not gender is a factor that definitely affects the NRM technology used by men and women must be investigated with secondary statistical analysis.

Table A.9. Gender and Access to Land
(percent of household heads and women; 99% of household heads are men)

Access to Land	Household Heads	Women
Own land*	92	24
Number of fields owned:*		
1-3	48	100
4-7	48	0
8+	5	0
Access to fields cultivated:**		
Inherited	56	13
Purchased	16	< 1
Loaned by a relative	7	6
Parcel in spouse's field ("loaned by spouse")	0	57
In the concession	0	18
Type of field:**		
Dune	55	50
Valley	23	17
Plateau	7	8
Hardpan (glacis)	7	17

* Percent of all men and women.

** Percent of all fields cultivated by men and women last season.

D. Use of Natural Resource Management Technology

D1. Investments in Modern Agricultural Inputs and Labor

There are definite differences between project and non-project households in their investments in modern inputs. These inputs are chemical fertilizer, improved seed, and pesticides; nobody reported using herbicides, and most people apparently do not know about and have not used them. Cash expenditures on inputs are shown in Table B.27. in Annex B. Seventy-one of the project households purchased chemical fertilizer last season, 53% purchased improved seed, and 82% purchased pesticides. In comparison, only 48% of non-project households purchased fertilizer, 23% purchased improved seed, and 67% purchased pesticides. The fact that

project households reported using very little of their credit, in cash or in kind, to purchase inputs may indicate that access to credit is not a major influence on the use of inputs.

Household-level cash expenditures on inputs are similar in project and non-project households (Table B.27.). Forty-five percent of all households that purchased fertilizer spent 1,000-10,000 CFA on fertilizer, 47% spent 10-60,000 CFA, and 8% spent more than 60,000 CFA. Of the households that purchased seed and pesticides, 90% spent 1-5,000 CFA on improved seed and 100% spent the same amount on pesticides. The information on household expenditures on modern agricultural inputs and labor for NRM is summarized in Table A.10. below.

Overall, project households' total expenditures for inputs were somewhat greater than non-project households'. Thirteen percent of all households did not purchase any inputs at all last season (Table B.28.). The largest proportion of households (41%) spent a total of 1-5,000 CFA on inputs. Twelve percent of project households spent a total of 40,000 CFA or more on inputs, in comparison to 4% of non-project households.

Fewer women reported purchasing fertilizer and pesticides than household heads (men), and more reported purchasing improved seed. Thirty-seven percent of women purchased fertilizer, 43% purchased pesticides, and 26% purchased improved seed (Table B.27.). Women also spent less on fertilizer: 78% spent 1-5,000 CFA whereas 70% of the men spent 1-20,000 CFA (Table B.27.). However, men's and women's expenditures on improved seed and pesticides are virtually the same.

The survey asked people if they had hired labor to help implement the NRM practices that they used in their fields during the past season. The responses from the project and non-project households are essentially the same (Table B.26.). Approximately one-third of all households reported hiring labor for this purpose last season, and all the household heads paid cash for it. Only women reported paying in both cash and in kind for such labor. Approximately three-quarters of all households that hired labor for NRM spent 1-10,000 CFA last season (Table B.26.).

**Table A.10. Household Expenditures on Modern Inputs and Labor for NRM
(percent of households)**

Household Expenditures	Project Villages	Non-Project Villages
Purchased fertilizer	71	48
Expenditures on fertilizer in CFA:		
1-10,000	47	42
10,001-60,000	45	52
> 60,000	9	6
Purchased improved seed	53	23
Expenditures on improved seed in CFA:		
1-5,000	91	88
Purchased pesticides	82	67
Expenditures on pesticides in CFA:		
1-5,000	100	100
Total household expenditures on inputs in CFA:		
0	9	17
1-5,000	38	44
5,001-40,000	41	35
> 40,000	12	4
Hired labor for NRM last season	35	38
Paid the labor in cash	100	100
Amount paid labor in CFA:		
1-2,000	17	27
2,001-10,000	56	46
> 10,000	27	27

D2. People's Use of Natural Resource Management Technology

The PTS survey shows that men and women use approximately 89 techniques to manage their agricultural fields, trees, pasture land, and water resources. These techniques are listed in Table B.51. in Annex B. Some of these techniques were added to our list during the survey because people reported them as NRM techniques, and they are valuable because they show

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people's perceptions of what constitutes "natural resource management." The techniques that people reported that may not be accepted by S.O.3 include: work in the fields; doing agricultural operations on time; collecting and storing crop residues for livestock; cleaning wells by hand or with machinery; buying supplementary feed for livestock; filtering drinking water; and maintaining the coping around wells.

The issue of defining "new" NRM techniques has been discussed thoroughly in Section III and will not be repeated here. We have used our judgement to identify what could be considered some "new" techniques among all those that people reporting using, which are listed in Table A.11. below.

Table A.12. below contrasts the use of new techniques in project and non-project villages. The frequencies indicate that more household heads in project villages use these techniques than those in non-project villages. The new techniques that more women in project villages use are in Table A.13. below. Statistical analysis is necessary to determine whether there is a significant associations between factors such as gender or residence in project villages and the use of certain NRM techniques.

Until these analyses are done, frequencies allow us to speculate on the potential effects of NRM projects and land ownership on people's use of NRM technology. As Tables B.38. and B.49. show, the household heads and women in project villages use greater numbers of NRM techniques in their fields and with their trees. Forty-one percent of project household heads reported that they currently use 10+ techniques in their agricultural fields; the figure for non-project household heads is 20% (Table B.38.). Similarly, 35% of project household heads use 7+ techniques to manage their trees, versus only 8% of non-project household heads. The differences between project and non-project women show the same trend but are not as great (Table B.49.). If "more is better" with NRM and if people's self-reported information is accurate, then projects apparently are making a positive impact on their use of NRM technology with fields and trees. There is no real difference between project and non-project household heads in the number of techniques used to manage pasture land and water: more than 90% use 1-6 techniques in each case (Table B.38.).

As discussed in Chapter III, we hypothesize that rural producers conceptualize agricultural production as one broad system for managing their natural resources; agro-pastoralism is another. In other words, they conceptualize agriculture as one subset of NRM, and agro-pastoralism as another. Producers' responses about NRM technology thus focus on agricultural production and their fields, which is likely to result in their listing more techniques used with agricultural fields than with other resources such as water and pasture land. For example, the question of whether dikes are a NRM practice for managing water or an agricultural practice for managing production depends on the interpreter's conceptual framework. (Does NRM have several subsets, including agriculture, agro-pastoralist, and pastoralism? Or does Agriculture have several subsets, including NRM, crop production, and tree production?) Based on the PTS, we hypothesize that rural producers conceptualize dikes primarily as an agricultural practice that may improve production, rather than primarily as an NRM technique to manage water that may improve production. This may have resulted in their "under-reporting" in the categories of water and pasture land management (Table B.38.).

**Table A.11. Household Heads' and Women's Use of New NRM Techniques
(percent of all household heads and women)**

New NRM Techniques	Household Heads	Women
Improved tree trimming	71	52
Pesticides	61	57
Protect natural regeneration	44	47
Chemical fertilizer	49	47
Mulching	44	11
Livestock corridors	36	41
Animal traction to cultivate	36	19
Control tree cutting	30	23
Micro check dam (micro-barrage)	20	13
Improved seed	26	37
Demi-lune for agriculture	13	7
Demi-lune for forestry	16	13
Land reserved for pasture	22	28
Windbreak	19	5
Seedling nursery	13	18
Irrigation with motor pump	11	10
Zai (tassa)	11	8
Dike (muret)	12	10
Prohibit burning the bush	4	16
Protect territory (mise en defens)	4	6
Improved cook stove	2	34

**Table A.12. Household Heads: Differences in New NRM Techniques Used
in Project and Non-Project Villages
(percent of household heads)**

NRM Techniques	Household Heads, Project Villages	Household Heads, Non-Project Villages
<u>New techniques:</u>		
Pesticides	67	55
Micro check dam (micro-barrage)	27	13
Demi-lune for agriculture	27	0
Demi-lune for forestry	27	4
Dike (muret)	24	0
Windbreak	27	10
Seedling nursery	26	0
Zai (tassa)	20	3
<u>Traditional techniques:</u>		
Picket livestock in field for manure (parcage)	18	35
Rock dike (cordon en pierre)	26	12
Transhumance	12	23
Burning	12	19
Traditional tree trimming	3	19

**Table A.13. Women: Differences in New NRM Techniques Used
in Project/Non-Project Villages
(percent of women)**

New NRM Techniques	Women, Project Villages	Women, Non-Project Villages
Plant trees	74	59
Pesticides	64	50
Protect natural regeneration	52	41
Fertilizer	62	32
Improved seed	50	28
Improved cookstove	39	28
Dike (diguette)	32	12
Control tree cutting	29	18
Demi-lune for forestry	24	2
Seedling nursery	35	2
Demi-lune for agriculture	14	0
Zai (tassa)	14	2

Frequencies also indicate that land ownership and the presence of NRM projects may be related to the use of NRM technology (Tables B.39. and B.50.). Approximately two-thirds of all the land-owning household heads surveyed reported using 6-9 NRM techniques in the fields they cultivated last season, whereas only 27% of all those who are landless did so. One-third of all land-owning household heads reported using 8-9 techniques in their fields last season; no landless household heads used this many techniques in their fields.

Fifty-seven percent of the land-owning household heads in project villages used 3-7 techniques in their fields during the past season and 44% used 8+ techniques. In comparison, 75% of those in non-project villages used 3-7 techniques in their fields last season and only 24% used 8+ techniques (Table B.39.). If more is better, then land ownership and the presence of NRM projects in villages may be associated with the use of NRM. This is another subject for statistical analysis.

D3. Reasons for Using NRM Techniques

Household heads' and women's reasons for using NRM techniques are documented in Tables B.34.-B.37. and Tables B.45.-B.48. respectively. People's reasons for using techniques

are documented separately for fields, trees, pasture and water (further analysis is required to collapse the responses into one list). The primary reasons reported by both men and women for using NRM techniques in their fields were to increase production and fertilize the soil. Other reasons included wood production, water infiltration, controlling desertification, shade, controlling insects, and increasing the agricultural area (Tables B.34. and B.45.).

Household heads' and women's most common reasons for using NRM techniques with trees were to develop/maintain trees, control desertification, protect their trees, wood production, water infiltration, and windbreaks (Tables B.35. and B.46.). People's major reasons for using NRM techniques in their pasture land were to manage feeding their livestock, livestock production (growth), and to control damage from livestock (Tables B.36. and B.47.). The primary reasons for managing water resources are to increase the water supply, hygiene, water infiltration, to control water, and to control erosion (Tables B.37. and B.48.). It is interesting that the most common reasons reported by household heads (men) and women are virtually the same for each natural resource. The major reasons for using all NRM techniques (not only new techniques) given by household heads in the project and non-project villages are summarized in Tables A.14. to A.17. below.

Table A.14. Household Heads: Major Reasons for Using NRM Techniques in Agricultural Fields (percent of all reasons)

Reasons	Project Villages	Non-Project Villages
Increase production	15	15
Fertilize the soil	11	10
Wood production	9	10
Help water infiltration	10	7
Control desertification	6	7
Delimit the field	6	6

Table A.15. Household Heads: Major Reasons for Using NRM Techniques with Trees (percent of all reasons)

Reasons	Project Villages	Non-Project Villages
Development/maintenance of trees	24	31
Fight against desertification	14	14
Protection	13	14
Wood production	11	16
Increase the number of trees	13	10
Help water infiltration	5	3

Table A.16. Household Heads: Major Reasons for Using NRM Techniques in Pastures (percent of all reasons)

Reasons	Project Villages	Non-Project Villages
Manage livestock feeding	39	46
Help livestock growth	30	28
Avoid damage from livestock	11	11
Improve pasture	8	8
Increase pasture area	7	8

Table A.17. Household Heads: Major Reasons for Using NRM Techniques with Water (percent of all reasons)

Reasons	Project Villages	Non-Project Villages
Increase water supply	23	30
Hygiene	15	28
Help water infiltration	19	8
Control water	12	9
Control erosion	11	6
Conserve water	10	4

D4. Sources of Knowledge for NRM Techniques Used

There is quite a difference between project and non-project villages in people's sources of knowledge about the NRM techniques that people currently *use*. "Tradition" is the major source of knowledge reported by men and women in both types of villages (Table A.18.). Missionaries and current projects are the other major sources of knowledge in project villages, and state technical agents are the major source in non-project villages. Information about NRM techniques evidently is diffused from fellow villagers and other villages, and these are slightly more important sources of information in non-project villages. The survey data thus indicate that "other villages" are minor sources of information for the NRM techniques that people currently use. However, "other villages" are a major source of information for the NRM techniques that people know about but do not use, as Table A.24. below shows.

Table A.18. People's Major Sources of Knowledge of All NRM Techniques Used (percent of all sources; combined responses from men and women)

Sources of Knowledge	Project Villages	Non-Project Villages
Tradition	45	61
State technical agents	12	18
Missionaries	21	3
Current project	13	< 1
Villagers	3	6
Another village	1	4
Past project	1	3

E. Knowledge of Natural Resource Management Technology

E1. New NRM Techniques Known But Not Used and Reasons for Not Using Them

The PTS asked people if they knew about NRM techniques, even if they currently were not using them, and their reasons for not using them. Table A.20. below lists some techniques that can be considered "new" that people reported they know about but do not use. The complete lists are in Table B.53. (household heads) and Table B.59. (women).

The principal reasons that household heads reported for not using the NRM techniques that they know about in their fields were lack of money (37% of all reasons), the inputs were not available (13%), lack of time (10%), and that it requires extra manual labor (9%) (Table B.55.). Women's primary responses for not using the techniques that they know about were lack of money (22% of all reasons); lack of land or space (13%); that it is men's work, which seemed particularly related to trees (12%); and that the inputs were not available (11%) (Table B.61.). Household heads' major reasons for not using the NRM techniques that they know about are summarized in Tables A.20. to A.23. below. Their most common reasons were lack of money, time, manual labor, and technical assistance. Lack of knowledge is not cited as a principal reason for not using NRM technology, except in the form of "lack of technical assistance."

**Table A.19. Households: New NRM Techniques Known, But Not Used
(percent of households*)**

New NRM Techniques	Project Villages	Non-Project Villages
Chemical fertilizer	52	77
Pesticides	41	58
Reserve land for pasture	39	45
Improved seed	36	46
Improved cook stove	29	38
Control tree cutting	27	39
Micro check dam (micro-barrage)	26	20
Prohibit burning the bush	24	16
Seedling nursery	17	23
Animal traction	21	17
Zai	26	13
Mulching	27	19
Windbreak	14	13
Demi-lune for agriculture	14	6
Demi-lune for forestry	15	3
Live fencing	8	10
Livestock corridors	3	12

* One response per technique per household, whether the technique is used with fields or trees or pasture or water. 66 project households and 69 non-project households.

Table A.20. Household Heads: Major Reasons for Not Using Known NRM Techniques in Fields
(percent of all reasons)

Reasons	Project Villages	Non-Project Villages
Lack of money	33	42
Input not available	9	16
Lack of time	13	7
Requires extra manual laborers	9	8
Lack of livestock	9	6
Not advantageous	7	3

Table A.21. Household Heads: Major Reasons for Not Using Known NRM Techniques with Trees
(percent of all reasons)

Reasons	Project Villages	Non-Project Villages
Lack of water	21	31
Lack of time	19	14
Lack of materials	8	10
Lack of manual labor	12	6
Lack of technical assistance	8	7
Lack of money	8	4
Not advantageous	12	1

Table A.22. Household Heads: Major Reasons for Not Using Known NRM Techniques in Pastures
(percent of all reasons)

Reasons	Project Villages	Non-Project Villages
Lack of land/space	21	23
No livestock owned	21	18
Lack of consensus	7	28
Not advantageous	18	8
Prohibited, fines	8	5

Table A.23. Household Heads: Major Reasons for Not Using Known NRM Techniques with Water (percent of all reasons)

Reasons	Project Villages	Non-Project Villages
Lack of technical assistance	44	48
Lack of money	9	15
Lack of materials	13	10
Not necessary	11	7
Lack of manual labor	7	7
Lack of time	7	5

E2. Sources of Knowledge of NRM Techniques Known But Not Used

People's major sources of knowledge of the techniques that they know about but do not use are tradition, other villages, and state technical agents (Table A.24. below). The fact that "another village" is reported as a major source of knowledge by people in both project and non-project villages indicates that information about NRM does diffuse across villages. Information also diffuses among fellow villagers, but they are a very minor source of information.

Table A.24. Men and Women: Major Sources of Knowledge of NRM Techniques Known, But Not Used (percent of all sources*)

Sources of Knowledge	Project Villages	Non-Project Villages
Tradition	36	32
Another village	19	33
State technical agents	12	18
Villagers	5	9
Missionaries	11	2
Current project	10	< 1
Past project	2	2

* Combined, multiple responses from men and women.

F. Conclusions

The PTS was a pilot survey limited to 135 concession in three regions of Niger. The data there are not representative of Niger and may be skewed due to the small sample size. As stated above, we believe that people probably under-reported the information they were asked about, so the data probably present a conservative picture. The tabulations and frequencies done for this report allow us to draw only general conclusions about the key variables that were the focus of the survey. These descriptive statistics do indicate differences between the major populations of interest, villages with and without NRM projects, which shows that secondary statistical analysis is necessary to determine if these differences are statistically significant. The purpose of this section is to highlight the key differences between the project and non-project populations, which suggest the starting points for further analysis.

The PTS data show that project and non-project households are similar in terms of many key characteristics. Their household economic systems, access to and ownership of land, and ownership of livestock are broadly similar. The differences in household sources of cash income suggest that project households are oriented less toward selling livestock and somewhat more toward selling food and cash crops and transforming agricultural products, whereas non-project households are slightly more oriented toward selling livestock, artisanry, and daily wage labor to earn cash. Whether or not these differences are significant, and whether they indicate that projects influence households' commercialization of agricultural products, remains to be determined. Project and non-project households also are similar in terms of their demographic composition and dependency ratios; levels of literacy and education; access to information about the Rural Code, market information, and climate information; and what people perceive they need to improve their agricultural production.

There are some differences between the two populations' access to cash credit, their use of modern agricultural inputs, and their use of NRM technology. The same proportion of households in project and non-project villages reported obtaining cash credit last year, but project households received more loans, more collective loans, larger amounts of cash, and reported that projects and CARE as major sources of their credit. Many more households in project villages purchased modern inputs (chemical fertilizer, improved seed, pesticides) than did the other households. Project households' total expenditures on these inputs also were greater than the other households' expenditures. Neither population used much of its cash credit to purchase inputs, but more people in project villages did receive inputs as credit in kind, and reported that projects were a major source of credit in kind, than in the other villages. These differences in the use of modern inputs suggest that projects may affect people's knowledge of, use of, or access to inputs.

Differences in people's use of NRM technology definitely must be investigated with secondary statistical analysis. The PTS data show that more households in project villages report using what can be considered new NRM techniques, including: planting trees, chemical fertilizer, improved seed, mulching, controlling tree cutting, improved cook stoves, dikes (*muret*, *diguette*, *cordon de pierre*), seedling nurseries, windbreaks, demi-lunes for agriculture and forestry, *zais*, designating protected territory, and planting trees to reclaim land. The data also show that people in project villages and those who own land used more NRM techniques in the fields they

cultivated in 1995 than did the people in non-project villages and those who rented fields. These differences suggest that projects have an effect on people's knowledge and behavior related to NRM.

The effect of gender on agricultural production and natural resource management, or men and women as additional populations of interest, is another key topic that the PTS data can address. In accordance with conventional wisdom about Nigerien women's economic and social roles, the PTS data indicate that, overall, women have less access to land, credit, modern inputs, and information from outside their villages than do men. The relationship between gender and NRM technology is a crucial one to explore quantitatively, because women, as well as men, are important agricultural producers and managers of natural resources. Understanding the relationship between gender and NRM is necessary to design appropriate programs and field activities. The PTS database provides the basis to investigate that relationship.

**ANNEX B
DATA TABLES**

GUIDE TO READING THE TABLES

1. Rounding off percentages may have produced totals such as 99% or 101%, rather than 100%. These are rounding errors.
2. Written numbers in the tables represent the number of people or households, not the percent.
3. The terms "concession" and "household" are used interchangeably in this report and its tables. A "concession" typically consists of members of an extended family unit, such as nuclear family or families, dependent children or parents, and single siblings. The concession members work some fields collectively and share granaries, under the authority of the concession head. Most but not all of the concession heads are men. If the head of the concession head is infirm or inactive, his oldest brother or son generally manages the concession's agricultural activities. The head of the concession is recognized as the head of the family by traditional authorities such as village chiefs and by the modern GON tax authorities. We found that the incidence of multiple nuclear families within a concession was infrequent.
4. We interviewed 135 heads of concessions. One hundred thirty four of these were men and one was a woman (.007% of the sample). The columns labeled "Household Heads" contain information from these 135 people.
5. The columns labeled "Women" contain information from the concession heads' first wives. N=134.
6. The columns labeled "Sample" contain information from the 135 concessions surveyed. This information is at either the concession level or it is the combined, multiple responses from the man and woman interviewed in each concession, as specified in each table.
7. The columns labeled "Project Villages" represent the 66 concessions surveyed in nine villages that currently are working with an NRM project. One pastoralist village is included in this category.
8. The columns labeled "Non-Project Villages" represent the 69 concessions surveyed in nine villages that are not working with NRM projects. Three pastoralist villages are included in this category.
9. The columns labeled "Tillaberi" contain information from the 39 concessions in six villages surveyed there.
10. The columns labeled "Tahoua" contain information from the 42 concessions in six villages surveyed there.
11. The columns labeled "Maradi" contain information from the 54 concessions in six villages surveyed there.

**Table B.1. Ethnicity and Residence of Household Heads
(percent of household heads*)**

	Sample	Tillaberi	Tahoua	Maradi	Project Villages	Non-Project Villages
Ethnicity:						
Haussa	53	0	64	82	59	46
Zarma	24	85	0	0	27	22
Peulh	11	15	0	17	0	22
Touareg	12	0	36	2	14	10
Number of years' residence in village:						
Less than 10	1	0	0	2	2	0
10+	99	100	100	98	98	100

*134 of the household heads were men and one was a woman.

**Table B.2. Sex and Education of the Household Heads and First Wives
(percents)**

	Household Heads	Wives
Sex of household head	99	1
Number of years of French school:		
None	94	96
1-3	1	2
4-6	3	1
7-10	2	1
Literacy:		
Not literate	77	96
Hausa	7	2
Zarma	2	0
Arabic	13	2
Tamashek	2	0

**Table B.3. Education and Literacy at the Household Level
(percent of household members)**

Education and Literacy	All Household Members
Number of years of French school:	
None	91
1-3	4
4-6	4
7-10	1
11+	< 1
Literacy:	
Not literate	93
Hausa	2
Zarma	< 1
Peulh	< 1
Arabic	5
Toubou	< 1
Gourmantche	< 1
Tamashek	< 1

Table B.4. Household Demographic Composition and Dependency Ratios

Demographic Characteristics	Sample	Tillaberi	Tahoua	Maradi	Project Villages	Non-Project Villages
Number of members per household*: 2-6	30	26	38	26	32	28
7-10	46	41	38	57	43	49
11-15	17	23	19	11	17	17
16+	7	10	5	6	8	6
Range, <u>number</u> of household members	2-30	2-30	4-24	3-19	3-24	2-30
Average <u>number</u> of household members	9	10	9	8	9	9
Percent of household members who are males	54	56	55	52	52	56
Percent of household members who are females	46	44	45	48	48	44
Percent of members < 15 years of age	44	40	42	48	45	42
Percent of members > 15 years of age	56	60	58	52	55	58
Household dependency ratios**	.8	.7	.7	.9	.8	.7

* For all columns: percent of households in each category.

** The ratio of adult household members (people 15 years of age and older) to non-adults (people < 15 years of age.)

Table B.5. Short-Term Migration During the Dry Season ("Exode")
(percent of households)

Number of Migrants Last Season	Sample	Tillaberi	Tahoua	Maradi	Project Villages	Non-Project Villages
None	67	49	52	93	70	65
One	20	26	31	7	17	23
Two	7	15	10	0	8	7
Three	3	8	2	0	5	1
Four	2	0	5	0	0	3
Five	1	3	0	0	2	0

**Table B.6. Households' Number of Major Economic Activities,
Reported by Household Heads
(percent of households)**

	Sample	Tillaberi	Tahoua	Maradi	Project Villages	Non-Project Villages
Number of activities:						
One	4	10	2	2	3	6
Two	36	41	29	39	32	41
Three	39	28	43	44	42	36
Four	17	18	24	11	20	15
Five	2	0	2	4	3	1
Six	1	3	0	0	0	1

Table B.7. Households' Major Economic Activities
(Percent of economic activities.
The numbered columns from left to right represent primary, secondary, and tertiary economic activities)

Economic Activities	Sample			Tillabéri			Tahoua			Maradi			Project Villages			Non-Project Villages		
	#1	#2	#3	#1	#2	#3	#1	#2	#3	#1	#2	#3	#1	#2	#3	#1	#2	#3
Rainfed agriculture	96	3	1	95	6	0	93	5	3	100	0	0	97	3	0	96	3	3
Animal husbandry	2	37	19	3	31	0	5	29	24	0	47	25	2	28	21	3	46	16
Artisanry	1	2	15	0	0	5	2	0	31	0	4	6	0	2	9	1	2	22
Rice production	1	4	0	3	14	0	0	0	0	0	0	0	2	5	0	0	3	0
Commerce	0	16	19	0	9	11	0	7	10	0	26	31	0	20	14	0	11	24
Seasonal migration (exode)	0	12	10	0	9	16	0	32	14	0	0	3	0	11	14	0	14	5
Livestock fattening (embouche)	0	7	13	0	0	16	0	12	7	0	7	16	0	6	16	0	8	8
Garden vegetable production	0	5	8	0	30	32	0	0	0	0	0	0	0	8	12	0	3	3
Wage labor paid by a project	0	2	0	0	0	5	0	2	3	0	0	0	0	5	2	0	0	0
Fishing	0	2	0	0	6	0	0	0	0	0	0	0	0	0	0	0	3	0
Transportation	0	2	0	0	3	0	0	2	0	0	0	0	0	2	0	0	2	0
Repairs	0	1	1	0	0	5	0	2	0	0	0	0	0	2	0	0	0	3
Daily wage labor	0	2	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
Butchery	0	2	1	0	0	0	0	0	0	0	4	3	0	2	0	0	0	3
Maraboutage	0	2	5	0	3	11	0	0	3	0	2	3	0	2	5	0	2	5

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Table B.8. Households' and Women's Sources of Cash Income
(percent of households and women*; page 1 of 2)

Sources of Cash Income	Households	Women
Animals or animal products	37	25
Peanuts	33	13
Souchet	25	2
Sesame	23	16
Commerce	24	13
Cowpeas	22	10
Sale of food	22	32
Weaving mats	20	37
Fattening livestock	16	22
Rice	16	12
Onions	13	9
Seasonal migration	12	< 1
Tobacco	10	0
Garden vegetable production	9	6
Transforming agricultural products	9	16
Artisanry	9	10
Cash remittances	8	0
Millet	8	3
Sale of forage	6	2
Maraboutage	6	0
Daily wage labor	4	8
Okra	4	17
Construction, sale of fish, wages for herding	3	4 (fish)
Hibiscus	2	3
Wood	3	2
Traditional pharmaceuticals	0	2

* Household information reported by household heads; information for women reported separately by women.

**Table B.8. Households' and Women's Sources of Cash Income
(percent of households and women; page 2 of 2)**

Sources of Income	Households	Women
Work paid by a project	2	0
Cowpea residues for fodder	2	0
Repair work	2	0
Griottage	2	0
Permanent salaried work	< 1	0
Teaching the Koran	< 1	0
Vouandzou (Bambara ground nuts)	< 1	0
Transport	< 1	0

Table B.9. Households' Sources of Cash Income
 (percent of households*; written numbers = number of households; page 1 of 2)

Sources of Cash Income	Sample	Project Villages	Non-Project Villages
25	37	33	41
10	33	39	28
16	25	35	16
35	24	29	19
13	23	26	20
7	22	24	20
32	22	26	17
31	20	23	17
11	16	14	19
26	16	15	16
12	13	23	5
46	12	17	7
18	10	5	16
17	9	14	5
34	9	11	7
40	9	6	12
1	8	9	7
47	8	8	9
24	6	6	6
37	6	6	6
42	4	3	6
14	4	8	0

*Household heads reported all sources of household cash income, generated by both men and women.

Table B.9. Households' Sources of Cash Income
 (percent of households; written numbers = number of households; page 2 of 2)

	Sample	Project Villages	Non-Project Villages
3	3	6	0
27	3	one	5
28	3	0	6
33	3	two	3
43	3	one	5
30	2	5	0
8	two	two	0
15	two	one	one
38	two	one	one
44	two	one	one
23	one	one	0
36	one	0	one
41	one	one	0
45	one	one	0
53	one	0	one

Table B.10. Knowledge of the Rural Code and Radio News*
(written numbers = number of people)

	Hshold Heads	Women	Sample	Project Villages	Non-Project Villages
Own a radio	30	---	30	30	30
Heard news of agricultural product prices during the past two weeks	70	52	61	66	57
Usually listen to news about the climate in rainy season	86	83	84	83	85
Climate news heard about: Rainfall	86	79	83	82	83
Locusts	85	82	84	82	85
Regional maturity of crops	86	75	80	80	80
Regional droughts	86	75	81	80	82
Know about the Rural Code	47	43	45	50	39
Rural Code themes heard about: Rapport between farmers and herders	93	86	89	89	89
Rural peoples' land tenure rights	53	53	52	52	53
Resolution of land tenure conflicts	88	64	78	76	77
Sources of information about Rural Code themes: Radio	87	59	73	76	71
Villagers	66	72	69	71	67
Village chief	36	55	45	41	48
Canton chief	18	10	14	13	15
GON agents	27	13	19	17	22
Extension agents (<i>animateurs</i>)	4	0	2	4	1
Television	two	0	<1	1	1
Ridd Fitila agents (<i>animateurs</i>)	0	0	0	0	0

* Percent of household heads and women for those columns. Percent of combined, multiple responses from men and women for the sample and village columns.

**Table B.11. Household Livestock Ownership
(percent of households)**

	Sample	Tillaberi	Tahoua	Maradi	Project Villages	Non-Project Villages
Ownership of: Cattle	50	72	2	70	52	48
Camels	7	3	17	4	6	9
Goats	80	46	95	93	77	83
Sheep	62	54	62	67	62	61
Horses	3	3	2	4	3	3
Donkeys	34	10	71	22	32	36
Traction animals: Oxen	42	51	0	68	48	36
Horses	0	0	0	0	0	0
Donkeys	3	0	2	6	4	1

Table B.12. Access to Credit in Cash
(written numbers = numbers of people)

Credit in Cash	Hshold Heads	Women	Sample	Project Villages	Non-Project Villages
Obtained credit in cash last year*	33	55	68	70	67
Number of times*:					
1	65	49	50	41	59
2-3	35	51	45	55	35
4-6	0	0	5	4	7
Type of credit**:					
Individual	95	85	89	80	99
Collective	5	14	11	19	one
Both	0	one	one	one	0
Sources of credit**:					
Private individual	83	56	65	55	77
Merchant	12	5	8	4	12
Project	4	21	15	27	0
CARE	one	4	3	6	0
Husband	0	15	9	8	11

* Percent of household heads and women for those columns. Percent of households for the sample and village columns.

** Percent of household heads and women for those columns. Percent of the combined men's and women's multiple responses for the sample and village columns.

Table B.13. Use of Credit in Cash*
(percent of loans; written numbers = number of people)

Use of Cash Credit	Hshold Heads	Women	Sample	Project Villages	Non-Project Villages
Food	23	8	13	6	21
Modern agricultural inputs	21	2	9	8	9
Commerce	12	19	16	17	16
Traditional ceremonies	11	25	20	20	19
Agricultural production	5	0	2	2	one
Health	5	2	3	6	0
Livstock fattening	4	19	13	21	4
Clothes	one	12	8	6	11
Travel	one	2	2	one	3
Family needs	one	5	4	4	4
Manure	one	0	one	0	one
Transportation	one	2	two	one	two
Local seed	0	one	one	one	0
Seedling nursery	0	one	one	0	one
Hire manual labor	0	one	one	one	0
Agricultural equipment	one	one	one	0	one
Sell animal products	0	one	one	0	one
Other	9	2	4	5	4

* Percent of household heads' and women's responses for those columns. Percent of combined men's and women's multiple responses for the sample and village columns.

Table B.14. Amount and Reimbursement Period of Credit in Cash
(written numbers = number of people)

Cash Credit Reimbursements	Hshold Heads	Women	Sample	Project Villages	Non-Project Villages
Amount of credit in CFA*: < 1,000	0	two	one	one	0
1,000 - 3,000	12	32	16	4	28
3,001 - 5,000	14	22	13	17	9
5,001 - 10,000	16	21	15	9	22
10,001 - 20,000	18	10	13	20	7
20,001 - 30,000	14	12	13	11	15
30,001 - 45,000	11	one	15	24	7
>45,000	16	one	13	13	13
Reimbursement period**: 1 - 6 months	91	71	78	71	87
7 - 12 months	5	12	10	13	5
13+ months	4	17	12	16	8

* Percent of household heads' and women's responses for those columns. Percent of households for the sample and village columns.

** Percent of household heads' and women's responses for those columns. Percent of the combined men's and women's multiple responses for the sample and village columns.

Table B.15. Access to Credit in Kind for NRM or Agriculture
(written numbers = number of people)

Credit in Kind	Hshold Heads	Women	Sample	Project Villages	Non-Project Villages
Obtained credit in kind for NRM or agricultural production last year*	30	22	45	48	42
Number of times*:					
1	71	45	72	75	69
2-3	16	53	24	25	24
4-5	0	one	one	0	one
6+	13	0	one	0	one
Sources of credit**:					
Private individual	65	61	63	34	89
Merchant	0	13	6	one	9
Project	27	18	23	49	0
CARE	6	one	5	7	one
CLUSA	2	two	3	7	0
Types of credit**:					
Food	55	26	43	34	50
Modern agricultural inputs	25	13	20	27	13
Livestock	8	13	10	20	one
Commerce	6	8	7	5	9
Transportation	one	0	one	one	0
Essential consumer goods	one	24	12	10	13
Hire labor	one	one	2	0	4
Local seed	0	8	3	2	4
Family needs	0	5	2	0	4

* Percent of household heads' and women's responses for those columns. Percent of households for the sample and village columns.

** Percent of household heads' and women's responses for those columns. Percent of the combined men's and women's multiple responses for the sample and village columns.

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**Table B.16. Reimbursements of Credit in Kind for NRM or Agriculture
(written numbers = number of people)**

Credit in Kind Reimbursements	Hshold Heads	Women	Sample	Project Villages	Non-Project Villages
CFA reimbursed for credit in kind*:					
1 - 10,000	51	82	59	59	59
10,001 - 20,000	33	13	16	16	17
20,001 - 30,000	4	one	8	6	10
30,001 - 40,000	8	one	10	13	7
40,001 - 50,000	0	0	0	0	0
> 50,000	two	0	four	two	two
Reimbursement period**:					
1-6 months	90	87	89	83	94
7-12 months	8	13	10	17	4
13-24 months	one	0	one	0	one

* Percent of household heads' and women's responses for those columns. Percent of households for the sample and village columns.

** Percent of household heads' and women's responses for those columns. Percent of the combined men's and women's multiple responses for the sample and village columns.

Table B.17. Land-Owning Household Heads*: Land Owned and Rented-In Last Season
(percent of people; written numbers=number of people; page 1 of 2)

Household Heads' Land Ownership	Household Heads	Project Villages	Non-Project Villages
Own land	92	94	90
Number of fields owned:			
1	11	3	18
2	18	16	19
3	19	19	19
4	21	23	19
5-7	27	29	25
8-17	5	10	0
Number of own fields cultivated last season:			
None	one	one	0
1	17	11	23
2	23	18	27
3	29	39	19
4	16	13	19
5	9	10	8
6	2	3	one
7-9	four	three	one
Left own fields fallow	32	44	21
Number of fields left fallow:			
1	73	63	92
2	15	19	one
3-4	12	18	0
Have right to plant fruit trees	100	100	100
Have right to dig wells	100	100	100

* Household heads = 134 men and one woman.

**Table B.17. Land-Owning Household Heads*: Land Owned and Rented-In Last Season
(percent of people; page 2 of 2)**

Household Heads' Land Ownership	Hshold Heads	Project Villages	Non-Project Villages
Rented out own fields	25	29	21
Number of own fields rented out:			
1	45	44	46
2	32	33	31
3-5	16	11	23
6-10	two	11	0
Rented-in additional fields	29	27	31
Number of fields rented-in:			
1	47	71	47
2	28	18	47
3	6	one	one
7	one	one	0

* Household heads = 134 men and one woman.

Table B.18. Landless Household Heads*: Land Rented-In Last Season
 (percent of people; written numbers = number of people)

Landless Men	Men	Project Villages	Non-Project Villages
Do not own land	8 (n=11)	6 (n=4)	10 (n=7)
Rented-in fields last season	100	100	100
Number of fields rented-in:			
1	one	25	0
2	27	0	43
3	36	25	43
4	18	25	one
9	one	one	0

* Household heads = 134 men and one woman.

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Table B.19. Women: Land Ownership and Use Last Season
(percent of women; written numbers = number of women)

Women's Land Ownership and Use	Women	Project Villages	Non-Project Villages
Percent of all women who own land	24	26	22
Right to plant fruit trees*	100	100	100
Right to dig wells*	100	100	100
Husband can reclaim fields*	6	12	0
Number of fields owned*:			
1	69	65	73
2	28	35	20
3	one	0	one
Cultivated parcels in husbands' fields**	73	71	75
Number of parcels cultivated**:			
1	60	55	65
2	28	32	24
3	10	9	12
5	two	two	0
Cultivated in concession**	27	30	24
Cultivated in a women's collective field**	5	9	one
Cultivated in a women's collective garden**	5	9	one
Cultivated other fields**	13	18	9
Number of other fields**:			
1	78	67	100
2	17	25	0
4	one	one	0

* Percent of women who own land.

** Percent of all women. Eleven percent of the women surveyed (14 women) did not cultivate any fields last season.

Women = 134; project = 66; non=project = 68.

Table B.20. Land Controlled and Cultivated by Households Last Season
(percent of all households; written numbers = number of households)

Household Land	Sample	Project Villages	Non-Project Villages
Number of fields controlled by households last season*:			
1	4	6	one
2	14	20	8
3	19	25	14
4	19	16	23
5	13	9	18
6	9	9	9
7	10	10	9
8	5	3	8
9-18	7	3	11
Number of fields cultivated by the household last season**:			
3	one	one	0
5	10	10	9
6	20	28	12
7	28	26	30
8	20	16	24
9	8	6	11
10	6	9	3
11-14	7	4	11

* Total of: men's fields owned, women's fields owned, and fields rented-in.

** Total of: men's fields cultivated, fields rented-in, women's collective fields cultivated, women's collective gardens cultivated, and women's other fields cultivated.

Sample = 135 households; project = 66; non-project = 69.

Table B.21. Household Heads: Types of Fields Cultivated*
(percent of fields)

Household Heads' Fields	Hshold Heads*	Project Villages	Non-Project Villages
Cultivated fields acquired by:			
Inherited	56	64	49
Purchased	16	14	17
Loaned by a relative	7	8	6
Clearing (<i>droit de la hache</i>)	6	3	9
Given by a relative	4	5	4
Loaned by a non-relative	4	3	6
Inherited through usufruct	2	2	3
Give by a non-relative	2	0	3
Sharecropped	2	0	3
Given by the state	<1	2	0
Women's field or garden	<1	2	0
Types of fields cultivated:			
Dune	55	49	61
Valley	23	27	19
Plateau	7	11	3
Hardpan (<i>glacis</i>)	7	5	9
Lowland (<i>bas fond</i>)	6	5	7
Dallol	2	3	1
Irrigated perimeter	<1	2	0
Exploiter of field this season:			
Collective household field	87	86	88
Non-household member	10	10	9
Individual man	3	3	3
Collectively by women	<1	2	0

* Household heads = 134 men and one woman.

**Table B.22. Household Heads: Crops Cultivated in the 1995 Agricultural Season
(percent of all crops in all fields)**

Crops	Hshold Heads	Project Villages	Non-Project Villages
Millet	31	30	33
Sorghum	20	19	21
Cowpeas	20	18	21
Peanuts	6	6	6
Sesame	5	6	4
Souchet	3	3	3
Rice	3	2	3
Hibiscus	2	2	3
Okra	2	3	1
Garden vegetables (including cassava, igname, potatoes)	1	<1	2
Onions	<1	<1	<1
Cultivated trees	<1	<1	0
Corn	<1	<1	0
Bambara ground nuts (vouandzou)	<1	<1	0
Other	<1	0	<1

**Table B.23. Women: Types of Fields Cultivated
(percent of fields)**

Women's Fields	Women	Project Villages	Non-Project Villages
Cultivated fields acquired by: Loaned by husband	57	55	59
Cultivated in the concession	18	13	22
Inherited	13	12	14
Loaned by a relative	6	8	3
Given by husband	3	5	2
Women's communal field or garden	2	3	0
Purchased	< 1	2	0
Sharecropped	< 1	2	0
Types of fields cultivated: Dune	50	50	51
Hardpan (<i>glacis</i>)	17	13	20
Irrigated perimeter	9	13	5
Plateau	8	10	7
Valley	8	7	9
Bas fond	7	5	9
Cuvette	< 1	2	0
Exploiter of field this season:			
Individual woman	63	70	56
Collective household field	33	22	44
Collectively by women	3	7	0
Non-household member	< 1	2	0

**Table B.24. Women: Crops Cultivated in the 1995 Agricultural Season
(percent of all crops in all fields)**

Crops	Women	Project Villages	Non-Project Villages
Cowpeas	16	14	18
Millet	16	15	17
Okra	15	16	14
Sorghum	14	14	14
Peanuts	10	10	10
Fonio	10	9	10
Sesame	9	9	9
Garden vegetables (including cassava, igname, potatoes)	4	5	2
Corn	3	3	2
Rice	2	2	2
Onions	2	3	1
Souchet	<1	<1	<1
Vouandzou (Bambara ground nut)	<1	<1	0
Cultivated trees	<1	0	<1

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Table B.25. The Three Things People Most Need to Improve Their Agricultural Production (percent of all responses*; written numbers = number of people)

Needs	Hshold Heads	Women	Sample	Project Villages	Non-Project Villages
Fertilizer (chemical)	25	20	23	23	22
Traction animals	13	6	10	10	9
Plows	10	9	9	9	10
Agricultural equipment	8	3	5	6	5
Money	7	14	10	10	11
Improved seed	6	13	9	11	8
Carts	6	7	6	6	7
Motor pumps	5	4	4	4	5
Good rain	5	6	5	5	5
Pesticides	5	10	7	7	8
Credit	4	2	3	2	4
Manure	2	2	2	1	2
Manual labor	2	1	1	1	2
Striation of fields	<1	one	<1	<1	one
Soil management	<1	2	1	2	<1
Labor on time	<1	2	1	2	<1
Fuel	<1	0	<1	0	<1
Tree plantations	one	<1	<1	<1	one
Mulching with straw	0	one	one	one	0
Other	two	0	two	two	0

* Percent of household heads' and women's responses for those columns. Percent of the combined men's and women's multiple responses for the sample and village columns.

Table B.26. Labor Hired for Natural Resource Management Last Year
(written numbers = number of people)

Hired Labor for NRM	Hshold Heads	Women	Sample	Project Villages	Non-Project Villages
Hired labor to do the NRM techniques used in agricultural fields last year*	13	32	36	35	38
Paid labor in cash	100	98	100	100	100
Paid labor in kind**	0	26	22	26	19
Amount paid labor in CFA*:					
1 - 2,000	11	26	23	17	27
2,001 - 5,000	28	37	31	30	31
5,001 - 10,000	11	23	20	26	15
10,001 - 20,000	22	12	10	9	12
20,001 - 40,000	17	0	12	13	12
40,001 - 60,000	one	one	0	0	0
> 60,000	one	0	two	one	one

* Percent of household heads and women for those columns. Percent of households for the sample and village columns.

** Some women (11 out of 43) reported paying labor in both cash and kind.

Table B.27. Cash Expenditures on Modern Agricultural Inputs Last Year*
(written numbers = number of people)

Expenditures on Modern Inputs	Hshold Heads	Women	Sample	Project Villages	Non-Project Villages
Purchased fertilizer	48	37	59	71	48
Fertilizer, expenditure in CFA:					
1 - 5,000	25	78	29	30	27
5,001 - 10,000	22	14	16	17	15
10,001 - 20,000	23	two	25	21	30
20,001 - 40,000	15	two	16	15	18
40,001 - 60,000	6	0	6	9	one
> 60,000	9	0	8	9	two
Purchased improved seed	17	26	38	53	23
Improved seed, expenditure in CFA:					
1 - 5,000	96	95	90	91	88
5,001 - 10,000	0	two	8	two	two
10,001 - 20,000	0	0	0	0	0
20,001 - 40,000	one	0	one	one	0
Purchased pesticides	59	43	74	82	67
Pesticides, expenditure in CFA:					
1,000 - 5,000	100	100	100	100	100

* Percent of household heads and women for those columns. Percent of households and household-level expenditures for the sample and village columns.

Table B.28. Total Cash Expenditures on Modern Agricultural Inputs Last Year
(percents; written numbers = number of people)

Total Cash Expenditures	Hshold Heads	Women	Sample	Project Villages	Non-Project Villages
Total expenditures on inputs, in CFA*: None			13	9	17
1,000 - 5,000	70	91	41	38	44
5,001 - 10,000	8	6	10	11	9
10,001 - 20,000	9	two	16	18	13
20,001 - 40,000	7	two	13	12	13
40,001 - 60,000	2	0	2	3	1
> 60,000	4	0	6	9	3

* Percent of household heads and women for those columns. Percent of households and household-level expenditures for the sample and village columns.

**Table B.29. Household Heads: General Knowledge and Use of NRM Techniques
(percent of household heads)**

	Hshold Heads	Project Villages	Non-Project Villages
Know NRM techniques to fertilize fields and increase harvest, but do not use them.	84	83	84
Know NRM techniques to conserve water or control erosion, but do not use them.	56	65	48
Use NRM techniques to manage household trees.	99	100	99
Use NRM techniques to manage communal forestry resources.	79	82	75
Know NRM techniques for trees, but do not use them.	51	53	49
Use part of household land only for pasture.	36	38	33
Use communal land for pasture.	85	91	80
Know NRM techniques for pasture, but do not use them.	58	58	58
Use NRM techniques to manage water.	97	99	96
Know NRM techniques to manage water, but do not use them.	71	68	74

Table B.30. Household Heads: All NRM Techniques Used with Fields, Trees, Pasture, and Water (percent of household heads*; page 1 of 4)

NRM Techniques Used	Hshold Heads	Project Villages	Non-Project Villages
Trees in the fields	99	99	99
Collect/store crop residues for livestock	94	96	93
Prune trees	86	86	86
Manure	72	76	68
Improved tree trimming	71	76	67
Clean wells by hand	64	70	59
Irrigation	62	68	57
Pesticides	61	67	55
Thin seedlings	60	59	61
Fence	60	68	52
Complementary livestock feed	60	62	60
Trees around fields	59	65	54
Plant trees	54	64	45
Fertilizer (chemical)	49	56	42
Protect natural regeneration	44	44	45
Mulching	42	52	33
Manual labor	36	32	41
Livestock corridors	36	36	35
Animal traction	36	38	33
Control tree cutting	30	36	25
Livestock in fields for manure (parcage)	27	18	35
Manual work around trees	27	32	22
Improved seed	26	35	17

* One response per technique per person, whether the technique is used with fields or trees or pasture or water. Household heads=135 men and 1 woman ; project = 66 household heads; non-project = 69 household heads.

Table B.30. Household Heads: All NRM Techniques Used, continued
(percent of household heads; page 2 of 4)

NRM Techniques Used	Hshold Heads	Project Villages	Non-Project Villages
Land reserved for pasture	22	30	15
Micro check dam (micro-barrage)	20	27	13
Fruit and leaves for fodder	19	18	20
Traditional wells	19	24	15
Maintain water works, any type	19	20	19
Windbreak	19	27	10
Dike (cordon de pierre)	19	26	12
Bushes around field	19	20	17
Control hyacinths	19	17	20
Transhumance	18	12	23
Demi-lune for forestry	16	27	4
Burn	16	12	19
Bushes around field	13	14	13
Demi-lune for agriculture	13	27	0
Dig out seasonal ponds (mares)	13	21	6
Maintain trees	13	15	10
Seedling nursery	13	26	0
Dike (muret)	12	24	0
Traditional tree trimming	11	3	19
Zai	11	20	3
Dike (diguette)	9	9	9
Irrigation with motor pump	9	12	6
Repair wells	8	12	4

Table B.30. Household Heads: All NRM Techniques Used, continued
 (percent of household heads; written numbers = number of people; page 3 of 4)

NRM Techniques Used	Hshold Heads	Project Villages	Non-Project Villages
Striation/cultivation with traction animals	7	8	7
Retain water around trees	7	6	9
Maintain well-coping (margelle)	5	one	9
Gravity irrigation	4	3	6
Prohibit burning the bush	4	8	0
Protect territory (mis en defens)	4	8	0
Weeding	4	one	6
Maintain Gao trees	4	6	one
Live fence	4	5	3
Ditch perpendicular to the slope (cut-off ditch)	3	6	0
Dike (banquette)	2	5	0
Improved cook stove	2	5	0
Firemen	2	5	0
Plant euphorbes	2	one	two
Improved fallow for pasture	2	0	4
Tube well	2	5	0
Cultivate fruit trees	two	0	two
40 trees per hectare	two	one	one
Plant trees to recuperate land	two	two	0
Direct seeding of pasture grass	two	one	one
Irrigation in rotation	two	two	0
Grass strips	one	one	0
Compost	one	0	one
Fallow	one	0	one

**Table B.30. Household Heads: All NRM Techniques Used, continued
(number of household heads; page 4 of 4)**

NRM Techniques Used	Hshold Heads	Project Villages	Non-Project Villages
Micro-bassin	one	0	one
Permeable rock dike (mini-barrage filtrant)	one	one	0
Contoured tree rows	one	0	one
Wild fruit plants	one	0	one
Protect trees	one	one	0
Reforestation	one	0	one
Manure on trees to repel livestock	one	one	0
Limit livestock's access	one	0	one
Evacuation canal for water	one	one	0
Clean wells with machinery	one	0	one
Water drainage	one	0	one
Cement wells	one	0	one

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**Table B.31. Household Heads: Principal NRM Techniques Used in Fields
(percent of household heads)**

NRM Techniques Used in Fields	Hshold Heads	Project Villages	Non-Project Villages
Trees in the field	99	99	99
Manure	72	76	68
Pesticides	61	67	55
Improved tree trimming	60	64	57
Thin seedlings	60	59	61
Trees around fields	59	65	54
Fertilizer	49	56	42
Mulching	42	50	33
Animal traction	36	38	33
Manual labor	34	30	38
Improved seed	26	35	17
Livestock in fields for manure (parcage)	24	17	32
Bushes in fields	19	20	17
Dike (cordon en pierre)	16	20	12
Protect natural regeneration	16	17	15
Burn	16	12	19
Bushes around fields	13	14	13
Demi-lune for agriculture	13	26	0
Zai	10	20	0
Traditional tree trimming	10	one	17
Windbreak	9	11	7
Dike (muret)	8	17	0

**Table B.32. Household Heads: Principal NRM Techniques Used with Trees
(percent of household heads)**

NRM Techniques Used with Trees	Hshold Heads	Project Villages	Non-Project Villages
Prune trees	86	86	86
Irrigation	62	68	57
Fencing	59	67	52
Improved tree trimming	57	61	54
Plant trees	53	64	44
Protect natural regeneration	42	41	44
Control tree cutting	30	36	25
Manual work around trees	27	32	22
Demi-lune for forestry	13	23	4
Maintain trees	13	15	10
Seedling nursery	13	26	0
Windbreak	11	18	4
Retain water around trees	7	6	9
Protect territory (mis en defens)	4	6	one

**Table B.33. Household Heads' Sources of Knowledge of All NRM Techniques Used
(percent of sources; written numbers = number of responses)**

Sources of Knowledge	Hshold Heads	Project Villages	Non-Project Villages
Tradition	49	43	57
State technical agents	19	17	23
Missionaries	12	19	4
Current project	6	11	one
Villagers	5	4	8
Past project	4	2	5
Personal knowledge	2	2	2
Another village	2	1	3
Radio	eight	five	three
Field study-visit	seven	two	five
No answer	three	three	0

**Table B.34. Household Heads: Reasons for Using NRM Techniques in Agricultural Fields
(percent of reasons)**

Reasons	Hshold Heads	Project Villages	Non-Project Villages
Increase production	15	15	15
Fertilize the soil	10	11	10
Wood production	9	9	10
Help water infiltration	9	10	7
Control desertification	6	6	7
Fertilize soil & increase production	6	5	7
Delimit the field	6	6	6
Protection against insects	6	5	6
Control erosion	5	6	5
Improve or recuperate soil	5	5	4
Increase agricultural area	4	4	5
Shade	4	4	5
Windbreak	4	3	4
Save time	3	3	4
Matures quickly, is precocious	3	3	2
Clean fields	2	<1	3
Diversify sources of manure	<1	<1	<1
Living fence	<1	<1	<1
State law	<1	<1	0
Control water	<1	<1	<1
Protection	<1	1	<1
Production of fruit	<1	<1	<1
Feed for livestock	<1	0	<1
Retain water	<1	<1	<1

**Table B.35. Household Heads: Reasons for Using NRM Techniques with Trees
(percent of reasons)**

Reasons	Hshold Heads	Project Villages	Non-Project Villages
Development/maintenance of trees	27	24	31
Fight against desertification	14	14	14
Protection	13	13	14
Wood production	13	11	16
Increase the number of trees	12	13	10
Help water infiltration	4	5	3
Wind break	3	4	2
Reforestation	2	4	<1
Shade	2	1	3
Recuperate terrain	2	3	<1
Control erosion	1	1	1
Improve soil fertility	1	1	<1
Cleaning	1	<1	2
Control water	<1	<1	<1
Improve quality of fruit trees	<1	<1	<1
Control cutting	<1	<1	0
Prohibited, fines	<1	<1	0
To have fruit	<1	<1	1
Delimit fields	<1	<1	<1
Live fencing	<1	<1	0
Fight against fire	<1	<1	<1
Traditional pharmaceutical	<1	<1	0
Decrease wood consumption	<1	<1	0
Generate income	<1	<1	0
No answer	<1	<1	<1

**Table B.36. Household Heads: Reasons for Using NRM Techniques in Pastures
(percent of reasons)**

Reasons	Hshold Heads	Project Villages	Non-Project Villages
Manage livestock feeding	42	39	46
Promote livestock growth	29	30	28
Avoid damage from livestock	11	11	11
Improve pasture	8	8	8
Increase pasture area	7	7	8
Protection	1	2	< 1
Restore the environment	< 1	1	0
Manure the fields	< 1	< 1	< 1

**Table B.37. Household Heads: Reasons for Using NRM Techniques with Water
(percent of reasons)**

Reasons	Hshold Heads	Project Villages	Non-Project Villages
Increase water supply	26	23	30
Hygiene	20	15	28
Help water infiltration	15	19	8
Control water	11	12	9
Control erosion	9	11	6
Conserve water	8	10	4
Protection	6	5	8
Cleaning	3	2	4
Repairs	2	1	3
Avoid accidents	<1	1	<1
Evacuate water	<1	<1	<1
Retain water	<1	<1	0

Table B.38. Household Heads: Number of NRM Techniques Used with Fields, Trees, Pasture, and Water (percent of household heads*)

Number of Techniques Used	Hshold Heads	Project Villages	Non-Project Villages
In agricultural fields:			
1-3	2	2	1
4-6	33	27	38
7-9	36	30	41
10-12	27	36	19
13+	3	5	1
With trees:			
1-3	29	14	44
4-6	50	52	48
7-9	19	30	7
10-12	3	5	1
13+	0	0	0
In pastures:			
1-3	56	47	65
4-6	41	50	32
7-9	3	3	3
10-12	0	0	0
13+	0	0	0
With water:			
1-3	80	67	93
4-6	15	24	6
7-9	5	9	1
10-12	0	0	0
13+	0	0	0

* Household heads = 134 men and one woman.

**Table B.39. Household Heads: Land Ownership and Number of NRM
Techniques Used in Fields**
(percent of household heads*; written numbers = number of household heads)

	All, Landed	All, Landless	Project, Landed	Project, Landless	Non- Project, Landed	Non- Project, Landless
Land ownership, percent of <u>all</u> household heads	92 (n=124)	8 (n=11)	46 (n=62)	3 (n=4)	46 (n=62)	5 (n=7)
Number of techniques used**:						
None	0	0	0	0	0	0
1-2	one	0	0	0	one	0
3-5	35	73	31	75	39	71
6-7	31	27	26	one	36	29
8-9	34	0	44	0	24	0

* Household heads = 134 men and 1 woman; project = 66 household heads; non-project = 69 household heads. All household heads reported cultivating fields last season.

** Percent of household heads for each column (not percent of all household heads).

**Table B.40. Women: General Knowledge and Use of NRM Techniques
(percent of women)**

	Women	Project Villages	Non-Project Villages
Know NRM techniques to fertilize fields and increase harvest, but do not use them.	84	80	88
Know NRM techniques to conserve water or control erosion, but do not use them.	51	58	44
Use NRM techniques to manage household trees.	96	99	94
Use NRM techniques to manage communal forestry resources.	84	86	81
Know NRM techniques for trees, but do not use them.	80	79	81
Use part of household land only for pasture.	34	27	40
Use communal land for pasture.	89	88	90
Know NRM techniques for pasture, but do not use them.	62	64	60
Use NRM techniques to manage water.	99	99	99
Know NRM techniques to manage water, but do not use them.	87	80	94

**Table B.41. Women: All NRM Techniques Used with Fields, Trees, Pasture, and Water
(percent of women*; page 1 of 4)**

NRM Techniques Used	Women	Project Villages	Non-Project Villages
Collect/stock crop residues for livestock	97	99	96
Irrigation	89	92	85
Fencing	85	94	77
Prune trees	84	89	79
Trees in fields	75	71	78
Complementary livestock feed	75	70	79
Fruits/leaves for fodder	67	64	71
Plant trees	66	74	59
Manure	65	65	65
Trees around fields	65	67	63
Pesticides	57	64	50
Improved tree trimming	52	52	53
Manual labor around trees	48	46	50
Fertilizer	47	62	32
Protect natural regeneration	47	52	41
Thin seedlings	42	33	50
Livestock corridors	41	44	38
Manual labor	40	41	38
Improved seed	37	50	28
Clean wells by hand	37	41	34
Improved cook stove	34	39	28
Land reserved for pasture	28	26	29
Livestock in fields for manure (parcage)	26	20	32

* One response per technique per woman, whether the technique is used with fields or trees or pasture or water. Women = 134; project women = 66; non-project women = 68.

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Table B.41. Women: All NRM Techniques Used, continued
(percent of women; page 2 of 4)

NRM Techniques Used	Women	Project Villages	Non-Project Villages
Bushes in fields	26	24	27
Burn	24	24	24
Control cutting trees	23	29	18
Control hyacinths	22	17	28
Dike (diguette)	22	32	12
Transhumance	22	12	31
Animal traction	19	18	21
Dig out seasonal ponds (mares)	19	24	15
Seedling nursery	18	35	one
Retain water around trees	18	23	13
Bushes around fields	17	17	18
Weeding	17	15	19
Dike (cordon en pierre)	16	20	13
Prohibit burning the bush	16	20	13
Dead fence	15	15	15
Traditional tree trimming	14	11	18
Demi-lune for forestry	13	24	one
Micro check dam (micro-barrage)	13	8	18
Mulching	11	9	13
Maintain water works, any type	11	17	6
Tube well	11	15	7
Maintain Gao trees	10	12	7
Irrigation with motor pump	10	14	6
Dike (muret)	10	17	3

Table B.41. Women: All NRM Techniques Used, continued
 (percent of women; written numbers = number of women; page 3 of 4)

NRM Techniques	Women	Project Villages	Non-Project Villages
Protect trees	8	8	9
Zai	8	14	one
Demi-lune for agriculture	7	14	0
Maintain trees	7	5	9
Repair wells	7	6	7
Live fence	6	5	7
Protect territory (mis en defens)	6	12	0
Evacuation canal for water	6	8	4
Dike (banquette)	5	6	4
Windbreak	5	6	4
Gravity irrigation	5	8	3
Plant trees to recuperate land	5	9	one
Striation/cultivation with traction animals	5	8	one
Wild fruit plants	5	5	4
Cement well	5	9	0
Plant euphorbres	4	5	3
Ditch perpendicular to the slope (cut-off ditch)	4	5	3
Protect well-coping (margelle)	4	6	one
Clean wells with machinery	3	3	3
Manure on trees to repel livestock	2	3	one
Water drainage	2	one	two
Cultivate fruit trees	2	0	two
Mound earth around plants (buttage)	2	two	0
Striation/cultivation by machine	2	0	two

**Table B.41. Women: All NRM Techniques Used, continued
(number of women; page 4 of 4)**

NRM Techniques Used	Women	Project Villages	Non-Project Villages
Reforestation	2	two	0
Grass strips	one	0	one
Dune fixation	one	0	one
Firemen	one	0	one
Cultivation/striation by hand	one	one	0
Plant on time	one	0	one
Traditional wells	one	one	0
Irrigation in rotation	one	0	one

**Table B.42. Women: Principal NRM Techniques Used with Fields
(percent of women)**

NRM Techniques Used with Fields	Women	Project Villages	Non-Project Villages
Trees in fields	74	71	76
Trees around fields	65	67	63
Manure	62	62	62
Pesticides	56	64	49
Improved tree trimming	48	46	50
Fertilizer	47	62	32
Thin seedlings	42	33	50
Manual labor	40	41	38
Improved seed	37	47	28
Bushes in fields	25	24	27
Burn	20	24	16
Animal traction	19	18	21
Bushes around fields	17	17	18
Weeding	17	15	19
Dike (cordon de pierre)	13	17	10
Traditional tree trimming	13	11	16
Mulching	11	9	13
Livestock in fields for manure (parcage)	10	6	15
Dike (diguette)	9	17	one
Irrigation with motor pump	9	14	4
Demi-lune for agriculture	7	14	0
Zai	7	12	one

* One response per technique per person, whether the technique is used with fields or trees or pasture or water.

**Table B.43. Women: Principal NRM Techniques Used with Trees
(percent of women)**

NRM Techniques Used with Trees	Women	Project Villages	Non-Project Villages
Irrigation	87	92	82
Prune trees	84	89	79
Fencing	83	92	73
Plant trees	66	74	59
Manual labor around trees	48	46	50
Protect natural regeneration	46	50	41
Improved cook stove	34	39	28
Control tree cutting	23	29	18
Improved tree trimming	22	26	19
Seedling nursery	18	35	one
Retain water around trees	18	23	13
Demi-lune for forestry	13	24	one
Protect trees	8	8	9

* One response per technique per person, whether the technique is used with fields or trees or pasture or water.

**Table B.44. Women: Sources of Knowledge of All NRM Techniques Used
(percent of sources)**

Sources of Knowledge	Women	Project Villages	Non-Project Villages
Tradition	56	47	67
Missionaries	14	23	3
State technical agents	11	7	15
Current project	8	14	<1
Husband	4	4	4
Villagers	4	2	5
Other village	3	1	5
Personal knowledge	1	1	2
Past project	<1	1	<1
Radio	<1	<1	<1
Private sector agents	<1	0	<1
Field study-visit	<1	0	<1
Women's group	<1	<1	0
No answer	<1	<1	0

**Table B.45. Women: Reasons for Using NRM Techniques in Agricultural Fields
(percent of reasons)**

Reasons	Women	Project Villages	Non-Project Villages
Increase production	12	13	11
Fertilize soil	8	8	9
Shade	8	7	9
Protect against insects	7	7	6
Increase agricultural area	6	5	7
Fertilize soil and increase production	6	6	5
Wind break	5	5	6
Delimit fields	5	5	6
Wood production	5	5	5
Fight against desertification	5	6	4
Help water infiltration	5	6	4
Cleaning	5	5	6
Improve/recuperate soil	4	5	4
Control erosion	4	6	2
Matures quickly, precocious	4	4	3
Livestock feed	3	3	4
Diversify manure sources	1	<1	1
Live fencing	<1	0	<1
Control water	<1	1	<1
Protection	<1	<1	1
Retain water	<1	1	<1

**Table B.46. Women: Reasons for Using NRM Techniques with Trees
(percent of reasons)**

Reasons	Women	Project Villages	Non-Project Villages
Development/maintainance of trees	24	22	25
Protection	13	12	15
Wood production	10	10	11
Fight against desertification	9	10	6
Increase number of trees	7	7	6
Help water infiltration	6	7	5
Reforestation	5	7	3
Decrease wood consumption	4	4	4
Shade	4	3	5
Wind break	3	3	4
Cleaning	3	2	4
Improve/fertilize soil	3	3	2
Recuperate terrain	2	3	2
Control water	2	2	3
Control erosion	2	2	<1
Improve quality of fruit trees	<1	<1	<1
Prohibited, fines	<1	<1	<1
To have fruit	<1	<1	<1
Delimit fields	<1	<1	<1
Live fence	<1	<1	<1
Fight against fire	<1	<1	<1
Save time	<1	0	<1
To have traditional pharmaceuticals	<1	<1	<1
Other reason	<1	<1	<1

**Table B.47. Women: Reasons for Using NRM Techniques in Pastures
(percent of reasons)**

Reasons	Women	Project Villages	Non-Project Villages
Promote livestock growth	39	39	39
Manage livestock feed	28	28	27
Avoid damage from livestock	12	11	12
Improve pasture	8	6	10
Manure the fields	5	6	5
Protection	5	6	4
Increase pasture area	2	2	2
Restore the environment	<1	2	27
Sale of forage	<1	<1	<1
Other reason	<1	0	<1

**Table B.48. Women: Reasons for Using NRM Techniques with Water
(percent of reasons)**

Reasons	Women	Project Villages	Non-Project Villages
Hygiene	31	26	38
Increase water supply	21	21	20
Control erosion	11	13	9
Manage water	10	11	9
Help water infiltration	7	9	5
Conserve water	5	4	7
Protection	5	5	5
Avoid accidents	5	6	4
Water evacuation	2	2	1
Water retention	1	1	1
Repairs	1	1	< 1
Cleaning	< 1	< 1	< 1

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Table B.49. Women: Number of NRM Techniques Used with Fields, Trees, Pasture, and Water
 (percent of women; written numbers = number of women)

Number of Techniques Used	Women	Project Villages	Non-Project Villages
In agricultural fields:			
0	12	11	13
1-3	3	one	4
4-6	24	23	25
7-9	31	29	34
10-12	24	27	21
13+	6	9	3
With trees:			
1-3	13	5	21
4-6	46	39	52
7-9	32	41	24
10-12	10	15	4
13+	0	0	0
In pastures:			
1-3	22	23	21
4-6	66	62	71
7-9	12	15	9
10-12	0	0	0
13+	0	0	0
With water:			
0	one	one	0
1-3	75	65	85
4-6	23	32	15
7-9	2	3	0
10-12	0	0	0
13+	0	0	0

Table B.50. Women: Land Ownership and Number of NRM Techniques Used in Fields
(percent of women*; written numbers = number of women)

	All Women, Landed	All Women, Landed	Project, Landed	Project, Landless	Non-Project, Landed	Non-Project, Landless
Land ownership, percent of women who cultivated fields	26 (n=32)	74 (n=88)	14 (n=17)	36 (n=43)	13 (n=15)	37 (n=45)
Number of techniques used**:						
None	0	3	0	two	0	one
1-2	0	0	0	0	0	0
3-5	one	16	0	7	one	24
6-7	16	16	24	16	one	16
8-9	16	18	one	19	27	18
10+	66	47	71	54	60	40

* 134 women were surveyed; 120 had cultivated fields during the last season, 60 in the project villages and 60 in the non-project villages. The information about land ownership and the number of NRM techniques used in the fields is from the 120 women who cultivated fields last season.

** Percent of the women in each column (not percent of all women).

**Table B.51. Households: All NRM Techniques Used with Fields, Trees, Pasture, and Water
(percent of households*; page 1 of 4)**

NRM Techniques Used	Sample	Project Villages	Non-Project Villages
Collect/stock crop residues for livestock	99	99	100
Trees in fields	99	99	99
Prune trees	96	96	97
Irrigation	93	99	88
Fencing	90	96	84
Manure	89	94	84
Plant trees	82	90	74
Trees around fields	81	85	78
Improved tree trimming	79	77	81
Pesticides	79	85	74
Complementary livestock feed	79	73	86
Thin seedlings	73	70	77
Fruit/leaves for fodder	73	70	75
Protect natural regeneration	70	73	67
Clean wells by hand	69	71	67
Fertilizer	64	76	54
Manual work around trees	57	56	58
Manual labor	55	52	58
Livestock corridors	54	50	58
Micro-bassin	54	50	58
Improved seed	52	64	41
Mulching	49	56	42
Control tree cutting	46	53	39
Animal traction	42	39	45

* One response per technique per household. Sample = 135 households; project = 66; non-project = 69.

**Table B.51. Households: All NRM Techniques Used, continued
(percent of households; page 2 of 4)**

NRM Techniques Used	Sample	Project Villages	Non-Project Villages
Land reserved for pasture	42	46	39
Bushes in fields	42	42	42
Livestock in field for manure (parcage)	38	30	45
Improved cook stove	34	41	28
Burn	33	29	38
Transhumance	30	23	38
Micro check dam (micro-barrage)	28	30	26
Bushes around fields	27	27	28
Dike (diguette)	27	38	16
Dig out seasonal ponds (mares)	27	33	20
Traditional tree trimming	24	14	35
Maintain water works, any type	24	27	22
Control hyacinths	24	18	30
Dike (cordon de pierre)	24	33	15
Seedling nursery	24	47	one
Retain water around trees	24	27	20
Windbreak	21	29	13
Demi-lune for forestry	21	36	6
Weeding	21	17	25
Traditional wells	19	24	15
Maintain trees	19	20	17
Prohibit burning the bush	19	23	15
Zai	16	29	4
Irrigation with motor pump	16	21	10

Table B.51. Households: All NRM Techniques Used, continued
 (percent of households; written numbers = number of households; page 3 of 4)

NRM Techniques Used	Sample	Project Villages	Non-Project Villages
Dike (murets)	15	27	2
Dead fence	15	15	15
Repair wells	14	17	12
Demi-lune for agriculture	13	27	0
Maintain Gao trees	13	17	9
Tube well	12	17	7
Striation/cultivation with traction animals	11	14	9
Live fence	10	9	10
Protect territory (mis en defens)	10	10	one
Protect trees	9	9	9
Maintain well-coping (margelle)	9	8	10
Gravity irrigation	8	9	7
Dike (banquette)	7	9	4
Plant trees to recuperate land	7	12	one
Evacuation canal for water	7	9	4
Plant euphorbes	6	6	6
Ditech perpendicular to the slope (cut-off ditch)	6	9	3
Wild fruit trees	5	5	6
Cement wells	5	9	one
Clean wells with machinery	4	3	4
Cultivate fruit trees	3	0	6
Firemen	3	5	one
Manure on trees to repel livestock	3	5	one
Water drainage	3	one	4

Table B.51. Households: All NRM Techniques Used, continued
 (percent of households; written numbers = numbers of households; page 4 of4)

NRM Techniques Used	Sample	Project Villages	Non-Project Villages
Reforestation	2	two	one
Improved fallow for pasture	2	0	4
Irrigation in rotation	2	two	one
Grass strips	two	one	one
Mound earth around plants (butage)	two	two	0
Striation/cultivation with traction animals	two	0	two
40 trees per hectare	two	one	one
Direct seeding of pasture grass	two	one	one
Compost	one	0	one
Dune fixation	one	0	one
Fallow	one	0	one
Micro-bassin	one	0	one
Permeable rock dike (mini-barrage filtrant)	one	one	0
Striation/cultivation by hand	one	one	0
Sow on time	one	0	one
Contoured tree rows	one	0	one
Limit livestock's access	one	0	one

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**Table B.52. Men and Women: Sources of Knowledge of All NRM Techniques Used
(percent of sources*; written numbers = number of responses)**

Sources of Knowledge	Sample	Project Villages	Non-Project Villages
Tradition	53	45	61
State technical agents	15	12	18
Missionaries	13	21	3
Current project	7	13	<1
Villagers	4	3	6
Another village	2	1	4
Past project	2	1	3
Husband	2	2	2
Personal knowledge	2	1	2
Radio	<1	<1	<1
Field study-visit	<1	<1	<1
Private sector	<1	0	<1
Women's group	one	one	0
No answer	<1	<1	0

* Combined, multiple responses from men and women.

Table B.53. Household Heads: All NRM Techniques Known, But Not Used
(percent of household heads*; page 1 of 4)

NRM Techniques Known	Hshold Heads	Project Villages	Non-Project Villages
Fertilizer (chemical)	39	33	45
Land reserved for pasture	25	20	30
Improved seed	24	23	25
Transhumance	24	23	25
Pesticides	23	20	26
Livestock in field for manure (parcage)	20	24	16
Dig out seasonal ponds (mares)	17	12	22
Fencing	16	15	16
Irrigation	15	11	19
Tube well	15	15	15
Animal traction	14	15	13
Clean wells with machinery	14	9	19
Zai	13	18	7
Manure	11	15	7
Permeable rock dike (mini-barrage filtrant)	10	9	10
Burn	10	14	10
Micro check dam (micro-barrage)	9	11	7
Mulching	9	15	3
Plant trees	9	5	13
Dike (muret)	8	5	12
Cement wells	8	6	10
Windbreak	7	5	10
Live fence	7	8	7

* One response per technique per person, whether the technique is used with fields or trees or pasture or water. Household heads=134 men and 1 woman; project = 66 household heads; non-project = 69 household heads.

Table B.53. Household Heads: All NRM Techniques Known, But Not Used
 (percent of people; written numbers = number of people; page 2 of 4)

NRM Techniques Known	Hshold Heads	Project Villages	Non-Project Villages
Check dam (barrage)	7	11	4
Demi-lune for forestry	7	11	two
Complementary livestock feed	7	9	4
Demi-lune for agriculture	6	8	4
Irrigation with motor pump	6	two	9
Collect/stock crop residues for livestock	6	5	7
Traditional tree trimming	5	11	0
Seedling nursery	5	one	9
Wild fruit trees	5	5	6
Traditional wells	5	6	4
Cultivate fruit trees	4	5	4
Dike (banquette)	4	5	3
Dike (cordon de pierre)	4	one	6
Livestock corridors	4	0	7
Fallow	4	one	4
Ditch perpendicular to the slope (cut-off ditch)	4	6	one
Direct seeding of pasture grass	4	one	6
Prune trees	3	one	4
Improved tree trimming	2	one	3
Dike (diguette)	2	two	0
Gravity irrigation	2	two	0
Manual labor	2	two	0

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Table B.53. Household Heads: All NRM Techniques Known, But Not Used
(percent of people; written numbers = number of people; page 3 of 4)

NRM Techniques Known	Hshold Heads	Project Villages	Non-Project Villages
Striation/cultivation with animal traction	2	one	3
Dune fixation	two	one	one
Improved cookstove	two	one	one
Striation/cultivation by hand	two	one	one
Plant trees to recuperate land	two	0	two
Retain water around trees	two	one	one
Transplant pasture grass (bourgou)	two	one	one
Control hyacinths	two	one	one
Maintain Gao trees	one	one	0
Gully plug (gabion)	one	one	0
Micro-bassin	one	0	one
Striation/cultivation with machinery	one	one	0
Sow on time	one	0	one
Test new varieties	one	one	0
Biological protection of ravine banks	one	one	0
Dead fence	one	0	one
Plant euphorbes	one	0	one
Trees around fields	one	one	0
Prohibit burning the bush	one	one	0
Protect territory (mis en defens)	one	one	0
Reforestation	one	0	one
Fruit/leaves as fodder	one	one	0
Improved fallow for pasture	one	one	0

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**Table B.53. Household Heads: All NRM Techniques Known, But Not Used
(number of people; page 4 of 4)**

NRM Techniques Known	Hshold Heads	Project Villages	Non-Project Villages
Clean wells by hand	one	0	one
Maintain well-coping (margelle)	one	one	0
Repair wells	one	0	one
Mechanical protection of ravine banks	one	one	0

Table B.54. Household Heads: Sources of Knowledge of All NRM Techniques Known, But Not Used (percent of sources)

Sources of Knowledge	Household Heads	Project Villages	Non-Project Villages
Other village	36	30	41
Tradition	20	24	17
State technical agents	17	14	20
Villagers	9	4	13
Missionaries	6	10	2
Current project	4	8	1
Past project	4	5	3
Personal knowledge	2	2	2
Field study visit	2	3	1*
Private sector agents	<1	2	<1
Radio	<1	<1	<1
No answer	<1	0	<1

**Table B.55. Household Heads: Reasons for Not Using Known NRM Techniques in Fields
(percent of reasons)**

Reasons	Household Heads	Project Villages	Non-Project Villages
Lack of money	37	33	42
Input not available	13	9	16
Lack of time	10	13	7
Requires extra manual laborers	9	9	8
Lack of livestock	6	9	6
Lack of materials	5	5	4
Not advantageous	5	7	3
Lack of technical assistance	3	4	3
Lack means of transportation	3	3	3
Lack of land/space	3	2	3
Lack of water	2	1	3
Attracts birds	1	1	1
Not necessary	<1	1	<1
Prohibited, fines	<1	2	0
Fields still productive	<1	0	1
Avoid bush fires	<1	0	<1

**Table B.56. Household Heads: Reasons for Not Using Known NRM Techniques with Trees
(percent of reasons)**

Reasons	Household Heads	Project Villages	Non-Project Villages
Lack of water	27	21	31
Lack of time	16	19	14
Lack of materials	9	8	10
Lack of manual labor	8	12	6
Lack of technical assistance	7	8	7
Lack of a seedling nursery	7	6	7
Lack of money	6	8	4
Not advantageous	6	12	1
Not necessary	3	0	6
Prohibited, fines	3	4	1
Not well known	3	2	3
Lack of land	2	0	3
Lack means of transport	2	0	3
Attracts birds	<1	2	0
Livestock damage	<1	0	1
Lack of remuneration	<1	0	1

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**Table B.57. Household Heads: Reasons for Not Using Known NRM Techniques in Pastures
(percent of reasons)**

Reasons	Household Heads	Project Villages	Non-Project Villages
Lack of land/space	22	21	23
No livestock owned	19	21	18
Lack of consensus	18	7	28
Not advantageous	12	18	8
Prohibited, fines	6	8	5
Not necessary	5	2	8
Lack of money	4	5	4
Lack of technical assistance	3	3	3
Lack of time	2	3	1
Requires a lot of water	2	3	1
Not well known	1	3	0
Inputs not available	1	2	1
Lack of materials	<1	2	0
Lack of manual labor	<1	0	1
Responsibility of state's technical services	<1	2	0
Other	<1	0	1

**Table B.58. Household Heads: Reasons for Not Using Known NRM Techniques with Water
(percent of reasons)**

Reasons	Household Heads	Project Villages	Non-Project Villages
Lack of technical assistance	46	44	48
Lack of money	12	9	15
Lack of materials	11	13	10
Not necessary	9	11	7
Lack of manual labor	7	7	7
Lack of time	6	7	5
Lack of water	5	5	6
Not well known	2	1	2
Lack of land/space	2	2	0
Lack means of transport	<1	0	1
Other	<1	1	0

**Table B.59. Women: All NRM Techniques Known, But Not Used
(percent of women*; page 1 of 4)**

NRM Techniques Known	Women	Project Villages	Non-Project Villages
Fertilizer (chemical)	49	33	63
Pesticides	38	27	49
Transhumance	35	46	25
Tube	35	33	37
Control tree cutting	34	27	40
Improved cook stove	33	27	38
Manure	32	33	31
Reserve land for pasture	28	29	28
Dig out seasonal ponds (mares)	28	24	31
Clean wells by hand	25	17	34
Cement wells	25	17	34
Improved seed	25	17	32
Traditional wells	24	20	28
Livestock in fields for manure (parcage)	22	23	21
Prohibit burning the bush	19	23	16
Micro check dam (micro-barrage)	19	21	16
Burn	18	18	18
Seedling nursery	16	15	18
Wild fruit trees	16	8	24
Traditional tree trimming	14	18	10
Fallow	14	14	15
Clean wells with machinery	14	17	12

* One response per technique per woman, whether the technique is used with fields or trees or pasture or water. Women = 134; project women = 66; non-project women = 68.

Table B.59. Women: All NRM Techniques Known, But Not Used, continued
(percent of women; page 2 of 4)

NRM Techniques Known	Women	Project Villages	Non-Project Villages
Manual labor	12	11	13
Dike (cordon de pierre)	11	9	13
Mulching	10	14	7
Irrigation	9	8	10
Maintain well-coping (margelle)	9	12	6
Zai	8	11	6
Fencing	8	14	3
Animal traction	8	9	6
Improved tree trimming	8	8	7
Irrigation with motor pump	8	6	9
Plant trees	8	8	7
Prune trees	8	9	6
Ditch perpendicular to the slope (cut-off ditch)	8	3	12
Collect/stock crop residues for livestock	8	6	9
Windbreak	7	11	3
Dike (diguette)	5	8	3
Thin seedlings	5	3	6
Permeable rock dike (mini-barrage filtrant)	5	one	7
Fruit/leaves for fodder	5	3	6
Repair wells	5	5	4
Demi-lune for agriculture	4	6	one
Dike (muret)	4	8	0
Reforestation	4	0	7
Compost	3	6	0

Table B.59. Women: All NRM Techniques Known, But Not Used, continued
 (percent of women; written numbers = number of women; page 3 of 4)

NRM Techniques Known	Women	Project Villages	Non-Project Villages
Livestock corridors	3	one	4
Dune fixation	3	0	6
Plant euphorbes	3	one	4
Protect territory (mis en defens)	3	5	one
Trees in fields	2	5	0
Dike (banquette)	2	5	0
Demi-lune for forestry	2	5	0
Weeding	2	two	one
Live fence	2	one	3
Firemen	2	one	3
Protect natural regeneration	2	two	one
Biological protection of ravine banks	2	two	one
Dead fence	2	0	4
Trees around fields	2	5	0
Limit livestock's access	2	two	one
Striation/cultivation with traction animals	two	0	two
Manual work around trees	two	0	two
Plant trees to recuperate land	two	one	one
Complementary livestock feed	two	two	0
Evacuation canal for water	two	one	one
Water drainage	two	one	one
Irrigation in rotation	two	one	one
Check dam (barrage)	two	one	one

**Table B.59. Women: All NRM Techniques Known, But Not Used, continued
(number of women; page 4 of 4)**

NRM Techniques Known	Women	Project Villages	Non-Project Villages
Cultivate fruit trees	one	0	one
Maintain Gao trees	one	one	0
Gravity irrigation	one	one	0
Multiply improved seed	one	one	0
Recuperate land	one	0	one
Graft trees	one	0	one
Direct seeding of pasture grass	one	0	one
Improved fallow for pasture	one	0	one
Maintain water works, any type	one	one	0
Control hyacinths	one	one	0

**Table B.60. Women: Sources of Knowledge of all NRM Techniques Known, but Not Used
(percent of sources)**

Sources of Knowledge	Women	Project Villages	Non-Project Villages
Tradition	42	43	41
Other village	21	13	28
State technical agents	14	11	16
Missionaries	7	12	2
Villagers	6	5	7
Current project	5	11	0
Husband	3	2	4
Personal knowledge	1	1	<1
Past project	1	1	1
Radio	<1	<1	<1
Private sector agents	<1	0	<1
No answer	<1	<1	<1

**Table B.61. Women: Reasons for Not Using Known NRM Techniques in Agricultural Fields
(percent of reasons)**

Reasons	Women	Project Villages	Non-Project Villages
Lack of money	22	16	27
Lack of land/space	13	12	14
Men's work	12	14	10
Input not available	11	5	16
Not necessary	5	8	3
Requires extra manual labor	5	7	3
Lack means of transport	5	6	3
Lack of time	5	5	4
No livestock owned	5	6	3
Don't know	4	4	5
Lack of materials	3	4	2
Not advantageous	3	2	3
Prohibit, fines	2	3	2
Fields still productive	2	1	3
Lack of water	2	2	2
Lack of technical assistance	1	2	< 1
Attracts birds	1	2	< 1
Avoid bush fires	< 1	0	< 1

**Table B.62. Women: Reasons for Not Using Known NRM Techniques with Trees
(percent of reasons)**

Reasons	Women	Project Villages	Non-Project Villages
Responsibility of state's technical services	27	26	27
Lack of water	17	12	20
Men's work	11	18	6
Prohibited, fines	10	14	8
Lack of money	8	6	9
Lack of seedling nursery	7	6	8
Lack of technical assistance	6	2	10
Lack of materials	6	10	2
Lack of time	5	4	5
Lack of manual labor	1	<1	2
Attracts birds	<1	<1	<1
Not necessary	<1	0	<1
Men's responsibility	<1	0	<1
Thieves	<1	<1	0
Fruit trees not cultivated	<1	0	<1

**Table B.63. Women: Reasons for Not Using Known NRM Techniques in Pastures
(percent of reasons)**

Reasons	Women	Project Villages	Non-Project Villages
No livestock	33	35	31
Lack of land/space	18	15	22
Lack of consensus	13	11	16
Prohibited, fines	9	9	9
Lack of money	5	3	7
Not necessary	5	4	5
Not advantageous	5	9	0
Men's work	4	5	3
Lack of time	2	2	3
Lack of manual labor	1	1	1
Lack of technical assistance	1	2	0
Lack of appropriate species	1	1	1
Lack means of transport	<1	0	1
Lack of materials	<1	1	0
Responsibility of the state's technical services	<1	0	1
Other	<1	1	0

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**Table B.64. Women: Reasons for Not Using Known NRM Techniques with Water
(percent of reasons)**

Reasons	Women	Project Villages	Non-Project Villages
Lack of technical assistance	33	30	36
Men's work	30	32	29
Lack of materials	12	14	10
Lack of water	8	7	9
Not necessary	5	4	7
Lack of manual labor	3	4	3
Lack of money	3	4	2
Lack of time	2	3	<1
Other	1	1	1
Lack of land/space	<1	<1	0
Not well known	<1	<1	0
Fields are far away	<1	0	<1

**Table B.65. Households: All NRM Techniques Known, But Not Used
(percent of households*; page 1 of 4)**

NRM Techniques Known	Sample	Project Villages	Non-Project Villages
Fertilizer (chemical)	64	52	77
Pesticides	50	41	58
Transhumance	47	52	42
Tube well	43	42	44
Reserve land for pasture	42	39	45
Improved seed	42	36	46
Manure	40	44	36
Dig out seasonal ponds (mares)	37	33	39
Improved cook stove	33	29	38
Livestock in fields for manure (parcage)	33	36	30
Control tree cutting	33	27	39
Cement wells	33	23	42
Traditional wells	27	26	29
Burn	26	30	22
Clean wells by hand	25	17	33
Clean wells with machinery	25	26	25
Micro-check dam (micro-barrage)	23	26	20
Fencing	23	27	19
Irrigation	21	18	25
Wild fruit trees	21	12	29
Prohibit burning the bush	20	24	16
Seedling nursery	20	17	23

* One response per technique per household, whether the technique is used with fields or trees or pasture or water. Sample = 135 households; project = 66; non-project = 69.

Table B.65. Households: All NRM Techniques Known, But Not Used
(percent of households; page 2 of 4)

NRM Techniques Known	Sample	Project Villages	Non-Project Villages
Animal traction	20	21	17
Traditional tree trimming	20	29	10
Zai	20	26	13
Mulching	19	27	19
Fallow	18	17	19
Plant trees	16	11	20
Manual labor	14	14	15
Windbreak	13	14	13
Dike (cordon de pierre)	13	11	16
Permeable rock dike (mini-barrage filtrant)	13	11	15
Collect/stock crop residues for livestock	13	9	16
Irrigation with motor pump	12	8	16
Dike (muret)	11	11	12
Prune trees	10	11	10
Ditch perpendicular to the slope (cut-off ditch)	10	8	13
Demi-lune for agriculture	10	14	6
Improved tree trimming	9	8	10
Demi-lune for forestry	9	15	two
Live fence	9	8	10
Maintain well-coping (margelle)	9	12	6
Check dam	9	12	6
Complementary livestock feed	8	12	4
Livestock corridors	7	one	12

Table B.65. Households: All NRM Techniques Known, But Not Used
(percent of households; written numbers = number of households; page 3 of 4)

NRM Techniques Known	Sample	Project Villages	Non-Project Villages
Dike (diguette)	7	11	two
Cultivate fruit trees	5	5	6
Dike (banquette)	5	8	3
Fruit/leaves for fodder	5	5	6
Repair wells	5	5	6
Thin seedlings	4	3	6
Dune fixation	4	one	7
Reforestation	4	0	9
Direct seeding of pasture grass	4	one	7
Striation/cultivation with traction animals	4	one	6
Plant euphorbes	4	one	6
Protect territory (mis en defens)	4	6	one
Compost	3	6	0
Gravity irrigation	3	5	one
Biological protection of ravine banks	3	5	one
Dead fence	3	0	6
Plant trees to recuperate land	3	one	4
Trees in fields	2	5	0
Weeding	2	3	one
Firemen	2	one	two
Protect natural regeneration	2	two	one
Trees around fields	2	5	0
Limit livestock's access	2	two	one
Control hyacinths	2	two	one

**Table B.65. Households: All NRM Techniques Known, But Not Used
(number of households; page 4 of 4)**

NRM Techniques Known	Sample	Project Villages	Non-Project Villages
Maintain Gao trees	two	two	0
Striation/cultivation by hand	two	one	one
Manual work around trees	two	0	two
Retain water around trees	two	one	one
Improved fallow for pasture	two	one	one
Transplant pasture grass (bourgou)	two	one	one
Evacuation canal for water	two	one	one
Water drainage	two	one	one
Irrigation in rotation	two	one	one
Gully plug (gabion)	one	one	0
Micro-bassin	one	0	one
Multiply seed	one	one	0
Recuperate land	one	0	one
Striation/cultivation by hand	one	one	0
Sow on time	one	0	one
Test new varieties	one	one	0
Graft trees	one	0	one
Maintain water works, any type	one	one	0
Mechanical protection of ravine banks	one	one	0

Table B.66. Men and Women: Sources of Knowledge of All NRM Techniques Known, But Not Used (percent of sources*)

Sources of Knowledge	Sample	Project Villages	Non-Project Villages
Tradition	34	36	32
Another village	26	19	33
State technical agents	15	12	18
Villagers	7	5	9
Missionaries	7	11	2
Current project	5	10	<1
Husband	2	1	3
Past project	2	2	2
Personal knowledge	1	2	<1
Field study-visit	<1	1	<1
Radio	<1	<1	<1
Private sector	<1	0	<1
No answer	<1	<1	<1

* Combined, multiple responses from men and women.

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Table B.67. Household Heads: Sets of NRM Techniques Used in Owned, Household Fields Last Season with Staple Food Crops*

Percent of Household Heads	Sets of NRM Techniques Used
Ninety-eight	Trees in the fields.
Seventy	Trees in the fields and manure.
Forty-six	Trees in the fields, manure, and thin seedlings.
Forty-six	Trees in the fields, manure, and improved tree trimming.
Thirty-eight	Trees in the fields, manure, thin seedlings, and trees around fields.
Thirty-four	Trees in the fields, manure, improved tree trimming, and thin seedlings.
Twenty-nine	Trees in the fields, manure, thin seedlings, improved tree trimming, and trees around the fields.
Eighteen	Trees in the fields, manure, thin seedlings, improved tree trimming, trees around the fields, and pesticides.

* This table summarizes information from 119 household heads who cultivated a total of 337 owned fields last season. "Owned" is defined as fields acquired through inheritance, purchase, given by a relative, and inheritance through usufruct. Millet, sorghum, and cowpeas represent 77% of all crops sown in these fields. The fields are collective, household fields.

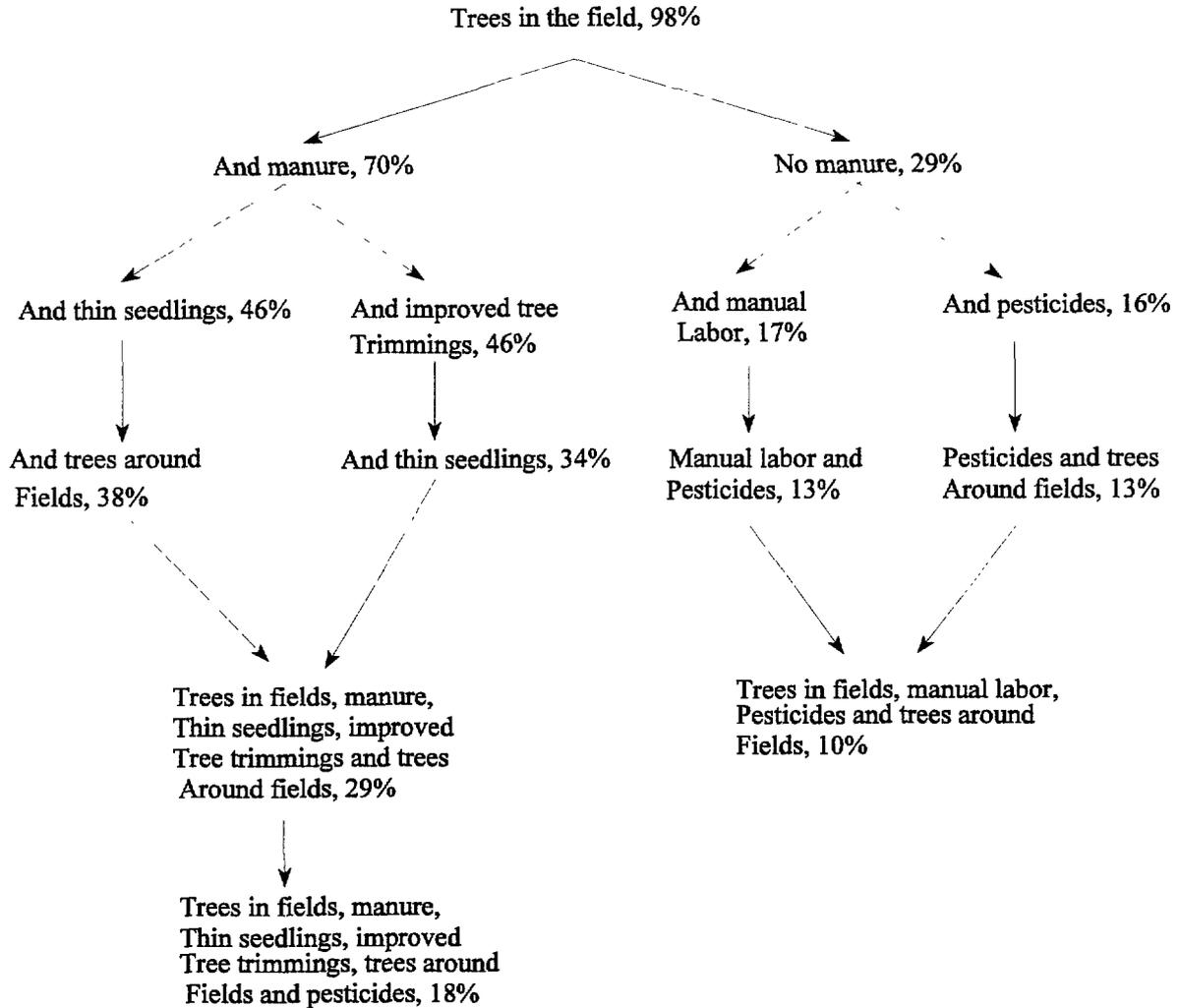
Table B.68. Household Heads: Non-Users of Manure: Sets of NRM Techniques Used in Owned, Household Fields Last Season with Staple Food Crops*

Percent of Household Heads	Sets of NRM Techniques
Ninety-eight	Trees in the fields.
Twenty-nine	No manure.
Seventeen	Trees in the fields and manual labor.
Sixteen	Trees in the fields and pesticides.
Thirteen	Trees in the fields, manual labor, and pesticides.
Thirteen	Trees in the fields, pesticides, and trees around fields.
Ten	Trees in the fields, manual labor, pesticides, and trees around the fields.

* Of the 119 household heads who own and cultivated a total of 337 fields, 34 people (29%) did not use manure last season. The diagram on the next page combines Tables 67 and 68.

Diagram B.1.

Household Heads: Sets of NRM Techniques Used in Owned, Household Fields
Last Season with Staple Food Crop*



* Information from 119 household heads who cultivated a total of 337 owned fields last Season. "Owned" is defined as fields acquired through inheritance, purchase, given by a Relative and inheritance through usufruct. Millet, sorghum and cowpeas represent 77% Of all crops sown in these fields. The fields are collective, household fields.

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ANNEX C
PRE-CODED LIST OF NATURAL RESOUCCE MANAGEMENT TECHNIQUES

TECHNIQUES D'AMENAGEMENT
Liste des Codes

997 = préciser, 998 = ne sait pas, 999 = aucune réponse.

CODE	FRANCAIS	HAOUSSA	ZARMA
CHAMPS:			
101	arboriculture fruitière	itace garka	turi nwari
102	arbres dans le champ	itace cikin gona	farira turi
103	arbres au tour du champ	itace iyaka gona	hirobon turi
104	arbustes dans le champ		
105	arbustes au tour du champ		
106	augmenter densité des cultures	kara yawan shipka	boungay bobandi
107	bandes enherbées	kuya ciyawa	subu batayan
108	banquettes	ginin duci	tondi kiniyan
109	brise-vent	dashen tarya iska	haw kossorey
110	buttage des plantes		
111	compost/compostage	rubaben taki ramen taki	birgui foumba
112	cordon de pierre	jeran duci	tondi sassarey
113	couloirs de passage	burtali	alman fonda
114	culture attelée	noman dabobi	yeggi farmi
115	culture pure	shipka iri daya	dumi fallon fari
116	culture associée	shipka garwaye	dumi bobo fari
117	défrichage traditionnel	sasabe galgajia	fari zorouyan
118	défrichage amélioré	sasabe zamani	zamani zorouyan
119	démariage	cira (rege shipka)	haini zobuyan
120	demi-lune agricole	rabin wata na shipka cimaka	handu farsime
121	demi-lune forestière	rabin wata na dashe itace	handu farsime
122	désherbage	cire ciyawa	subu doguyan

CODE	FRANCAIS	HAOUSSA	ZARMA
CHAMPS:			
123	diguette		tondi kiniyan
124	engrais chimique	takin zamani	anassara birgui
125	entretien de Gao	tatali Gao	Gao hanseyan
126	fixation des dunes	tsayda tudu	laabu guro gangiyan
127	fosse fumière	ramen taki	birgui goussou
128	fumier	takin galgajia	alman birgui
129	foyer amélioré	murhun zamani	zamani feema
130	gabion		
131	haie vive	darni ice	turi kali
132	herbicide	magani kashin ciyawa	subu wiyan safari
133	irrigation	ban ruwa	hangandi
134	irrigation par motopompe	ban ruwa da injin	moter hangadiyan
135	irrigation gravitaire	ban ruwa da gota	gota hangadiyan
136	jachère	futawal gona	fari fulanzam
137	labours	noma	farmi
138	main d'oeuvre	lebra	goy ize
139	micro-barrage	kashin gebe	goruwiyan
140	micro-bassin	dubara tarya ruwa	hari kossorey dabari
141	mini-barrage filtrant		
142	mulching	bugun kara	kwari zoruyan
143	multiplication de semences améliorées	yada iri	dumi wassa
144	paillage	wacin haki	subu sayan
145	parcage (ou gardiennage, ou contrat fumure.)		
146	pare-feu	hanya kashin wuta	dangi wiyan fonda
147	pré-labours	noman huri	labu tounandiyan
148	produits phytosanitaires	magani kashen kuwari	gagami ize safari
149	protection de la régénération naturelle	kulawa da itace sabon tashi	turi ize hagoy

CODE	FRANCAIS	HAOUSSA	ZARMA
CHAMPS:			
150	récupération de terre	raya karkara	laabo hanseyan
151	régénération naturelle	falfaduwa karkara	turigna kanga fatta
152	scarifiage manuel	barje	laabu tunandiyen
153	scarifiage avec animaux	barjen chanou	
154	scarifiage avec machine	barjen injin	
155	semences améliorées	iri mai gowgawa	dumi wassa
156	semencier à temps	shipka alkoci	dumari da hiney
157	sous-solage mécanisé	huda da inji	laabu boguyan
158	tests variétaux	gona gwado	haini dumi siyan
159	tranchées Nardi	gurzuwa zomo	
160	U.C.A (unité de culture attelée)	noman dabobi	yeggi farmi
161	zai	tassa	gusu-gusu
162	brûlis		
163	murets		
164	protection biologique des berges		
165	haie mort		
166	planter des arbres		
167	planter des euphorbes		
168			
169			
170			
171			
172			
173			
174			
175			

CODE	FRANCAIS	HAOUSSA	ZARMA
ARBRES:			
201	40 arbres/hectare	yawan itace a eka guda	turi dimma
202	arbres dans le champ	itace cikin gona	farira turi
203	arbres autour du champ	itace iyaka gona	hirobon turi
204	arbustes dans le champ		
205	arbustes autour du champ		
206	bandes arborées		
207	brise vent	dashen tariya iska	hawkossorey
208	clôture	kila/darni	kakka/kali
209	contrôler la coupe des arbres	kula da sara ice	turi wiyan hawzu
210	défrichage traditionnel	sasabe galgajia	fari zorouyan
211	défrichage amélioré	sassabe zamani	zamani zorouyan
212	demi-lune forestière	rabin wata na shipka itace	turi dumayan handu farsime
213	élagage	sassaka	turi kebuyan
214	entretien des arbres		
215	fixation des dunes	tsayda tudu	laabu guro gangiyan
216	foyer amélioré	murhun zamani	zamani feema
217	greffage	awre ice	
218	haie vive	darni ice	turi kalli
219	interdiction de feu de brousse		
220	irrigation	ban ruwa	hangandi
221	irrigation goutte à goutte		
222	labours au tour des arbres	noman gindi itace	turi tiksa farmi
223	mise en défens (gardiennage)		
224	pare-feu	hanya kashin wuta	dangi wiyan fonda
225	pépinière	wurin raya iri	turi ize sajo kali
226	plantation euphorbes	dashe aguwa	kokka singyan
227	planter des arbres pour la récupération de terre	dashen ityace dan raya karkara	turi dumayan laabo tunandisey

CODE	FRANCAIS	HAOUSSA	ZARMA
ARBRES:			
228	planter des arbres	dashen itace	turi dumayan
229	plants fruitiers	itace lambu	turi nwari
230	protection d'arbre	kulawa da ice	turi hawzuyan
231	protection de la régénération naturelle	tatalin arzikin karkara	laabo arzaka hagoy
232	reboisement	kara yawa itace	turi duma dabayan
233	rétention d'eau autour des arbres		
234	entretien de Gao		
235	brûlis		
236	aspersion bouse de vache		
237	murets		
238	protection biologique des berges		
239	banquettes		
240	fumier		
241	cordon de pierre		
242	tranchees perpendicu-laires au pente		
243	haie mort		
244	produits phytosanitaires		
245			
246			
247			
248			
249			
250			

CODE	FRANCAIS	HAOUSSA	ZARMA
PATURAGE:			
301	collecte et stockage de résidus de récolte	tara ciyawa dabobi	subu marguyan
302	couloirs de passage	burtali	alman fonda
303	ensilage ou silo	rubun ciyawa	subu albarkante barma
304	espace réservé pour pâturage (ou aires pastorales)	makiaya	alman kuredo
305	feuille et fruits des arbres comme pâturage		
306	mise en défens		
307	parcage (ou gardiennage, ou contrat fumure.)		
308	plantation euphorbes	dashe aguwa	kokka singyan
309	pare-feu	hanya kashin wuta	dangi wiyen fonda
310	semis direct de fourrage	shipka iri ciyawa	subu dumiize sayan
311	semis à temps	shipka alokoci	dumari da hiney
312	collecte et stockage de foin de brousse	tara ciyawa	subu margay
313	transhumance		
314	brûlis		
315	limiter l'accès		
316	haie mort		
317	alimentation complémentaire de bétail		
318	collecte de bourgou		
319	interdiction de feu de la brousse		
320	jachère améliorée pastorale		
321	repiquage de bourgou		
322	murets		
323	tranchées perpendiculaires au pente		

CODE	FRANCAIS	HAOUSSA	ZARMA
PATURAGE:			
324	demi-lune		
325	banquettes		
326	portion de champs reserves au paturage		
327	planter des arbres		
328	jachere		
329			
330			
331			
332			
333			
334			
335			

CODE	FRANCAIS	HAOUSSA	ZARMA
L'EAU:			
401	canal d'évacuation		
402	clôture		
403	cordon de pierre	jeran duci	tondi sassarey
404	curage de puits à la main (nettoyage)	yassa rijiya	deyzibo kayan
405	curage de puits avec machine (nettoyage)		
406	demi-lune agricole	rabin wata na shipka cimaka	handu farsime
407	demi-lune forestière	rabin wata na dashe itace	handu farsime
408	diguette		
409	drainage	jan rawa	hari guruyan
410	fonçage de puits traditionnel	ginan rijiya	dey kiniyan
411	irrigation	ban ruwa	hangandi
412	irrigation par motopompe	ban ruwa da inji	moter ga hangandiyan
413	irrigation gravitaire	ban ruwa da gota	gota ga hangandiyan
414	margelle		
415	micro-barrage	kashin gebe	goruwiyan
416	mini-barrage filtrant		
417	planter des arbres	dashen itace	turi dumayan
418	puits en ciment	rijiya	dey
419	récupération de terre	raya karkara	laabo hanseyan
420	réparation de puits	gyaran rijiya	dey hanseyan
421	surcreusage de mare	yassan tapki	bongo hanseyan
422	tour d'irrigation	kalandar ban ruwa	hangandi alwatto
423	entretien, surveillance		
424	filtration de l'eau		
425	lutte contre les juncynthes		
426	forage		
427	tranchés perpendiculaires au pente		

CODE	FRANCAIS	HAOUSSA	ZARMA
L'EAU:			
428	murets		
429	barrage		
430	protection biologique des berges		
431	protection mecanique des berges		
432	banquettes		
433	zai (tassa)		
434	micro-bassin		
435	labour		
436	paillage		
437	planter des euphorbes		
438	bandes enherbes		
439	bandes arbores		
440			
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445			

ANNEX D
MANUAL AND LIST OF KEY TERMS FOR ENUMERATORS

Manuel de l'Enquêteur

Pré-Test de l'Enquête GRN
USAID/NRMA et la Cellule/GRN
Niger, 1995

Octobre 1995

INTRODUCTION

La Mission de l'USAID au Niger vient d'adopter un plan stratégique de ses interventions au Niger pour la période 1995-2002. Un des objectifs stratégiques que vise ce plan est "d'améliorer l'adoption des pratiques de conservation et d'utilisation productive des ressources naturelles".

Et dans ce cadre, il est prévu de mener une enquête-ménage au niveau national en 1996 afin d'évaluer les données de base en ce qui concerne la mise en oeuvre des activités en matière de gestion des ressources naturelles au Niger.

Mais dans un premier temps, la mission USAID a prévu de financer d'Août 1995 à Février 1996 un pré-test préparatoire à l'enquête nationale de base de 1996. Cette enquête préliminaire pour laquelle nous sollicitons votre franche collaboration, consiste à administrer une série de questionnaires (questionnaire pour le chef de ménage, questionnaire pour les femmes et questionnaire village) auprès des ménages ruraux afin de recueillir des informations concernant leur connaissance sur les techniques GRN, mais également évaluer leurs modes d'utilisation et de conservation des ressources naturelles.

C'est pour mener à bien ce travail que nous avons requis votre concours dans le déroulement du pré-test. Aussi, pour vous permettre de mieux cerner votre mandat dans le cadre de ce travail, nous vous prions de lire attentivement les consignes et explications qui vous seront fournies dans ce présent manuel.

A. Consignes générales

N'oubliez jamais que la qualité de ce travail dépend de la sincérité des réponses; cette sincérité dépend de la façon dont vous interrogez les personnes: ne suggérez jamais une réponse mais aider éventuellement la personne à la formuler.

1. En arrivant dans un village, présentez-vous d'abord au chef de village et ce, de concert avec les autres enquêteurs; il vous aidera.
2. Soyez aimable et poli avec la population, ne vous laissez entraîner dans aucune discussion. Conformez-vous aux habitudes des gens. Ne heurtez personne.
3. Rappelez à chaque fois que c'est nécessaire le motif de votre mission aux enquêtés.
4. Assurez l'enquêté (e) que les renseignements sont confidentiels et non fiscaux.
5. Evitez formellement que des personnes étrangères à la concession n'assistent à l'entretien.

6. L'administration des questionnaires concernant le chef de ménage et les femmes doit être faite au sein d'un même ménage et ce de manière concomitante mais séparément.
7. Il faudrait utiliser votre propre jugement face à une situation où la personne enquêtée refuse de répondre correctement aux questions posées ou que vous voyez que ses réponses sont vagues et imprécises; il y a lieu de dire "merci" et de quitter;

A1. Personnel requis

Pour mener à bien ce travail, il sera procédé au recrutement de 5 enquêteurs dont 3 femmes et 2 hommes ayant un bon niveau de connaissance du monde rural et capables de travailler en équipe.

A2. Contrôle du travail

Chaque enquêteur ou enquêtrice travaillera sous les ordres du superviseur et de son homologue national. Le rôle du superviseur et de son homologue est le suivant:

1. Encadrer et former les enquêteurs et enquêtrices.
2. Exercer un contrôle qualitatif et quantitatif sur le travail de l'enquêteur (trice);
3. Assister l'enquêteur (trice) dans l'exécution de son travail en cas de difficultés (non compréhension des instructions, refus de la part des enquêtés etc...);
4. Procéder avec l'enquêteur aux formalités de révision et de restitution des données recueillies.

A ce titre, l'enquêteur (trice) se conformera de la façon la plus rigoureuse aux remarques et consignes des superviseurs.

B. En quoi consiste votre travail?

Il est très important de bien connaître les principes, règles et définitions décrits dans ce manuel. Ils expliquent le détail de votre travail.

B1. Qui devez-vous enquêter ?

Cette enquête s'adresse aux chefs de ménage et aux femmes. L'unité d'enquête et d'analyse c'est le ménage. Ainsi dans chaque ménage de l'échantillon un enquêteur et une enquêtrice doivent en même temps administrer leur questionnaire de la manière suivante: l'enquêteur va s'adresser au chef de ménage, tandis que l'enquêtrice va enquêter sa femme en l'occurrence la première femme du moins celle qui est la mieux responsabilisée en termes de gestion des ressources appartenant au ménage.

Il est ainsi obligatoire de faire ces deux questionnaires en binôme dans le même ménage sinon le travail pourrait s'avérer incomplet.

Par ailleurs dans des rares cas on peut rencontrer des ménages dans lesquels le chef de ménage est une femme (veuve en général); dans ce cas on utilise le questionnaire "chef de ménage" pour elle

et une autre femme du ménage, celle qui suit directement le chef de ménage en termes de responsabilité doit être enquêtée à l'aide du questionnaire "femme".

B2. Qu'est ce qu'un ménage

Le ménage est un ensemble de personnes qui habitent dans un même logement, travaillent dans les mêmes champs et qui mangent la nourriture sur un même feu. En outre ces personnes doivent disposer d'un budget commun.

Le ménage occupe une, plusieurs ou toutes les cases de la concession.
Comme plusieurs ménages peuvent cohabiter dans une même concession.

Le chef de ménage est la personne responsable du ménage. Il (elle) est aussi celui qui se déclare comme tel. Il (elle) assume la responsabilité de l'utilisation des ressources du ménage et des dépenses communes. Il s'agit généralement du mari ou de la personne la plus âgée du ménage.

Toutefois on peut rencontrer certaines femmes qui sont chef de ménage.

C. Qu'est qu'une ressource naturelle ?

Une ressource naturelle est constituée des éléments suivants: terre, eau, sol, végétation, forêts, arbres, pâturage etc.

Dans le cas d'espèce il s'agit des champs agricoles, des sites maraîchers, des arbres, des pâturages, de l'eau etc...

Toutefois dans la collecte des données relatives à cette enquête, il y a deux niveaux de perception qui nous intéressent à savoir:

1. Evaluation des connaissances en matière des techniques GRN des ménages ruraux;
2. Evaluation de l'utilisation actuelle de ces techniques au niveau des ménages ruraux;

D. Où et quand se fera l'enquête

L'enquête ménage se fera dans chacun des villages ou campements choisis dans le cadre de l'échantillonnage. Les enquêteurs choisiront l'heure ou le moment le plus favorable. Ce sera soit le matin ou le soir. Le questionnaire sera rempli à l'intérieur de la concession du ménage choisi au hasard.

E. A qui faut-il s'adresser

Une approche idéale pourrait être celle-ci:

1. Saluer le chef de village : lui expliquer le but de votre mission et demander qu'il réunisse les chefs de famille.

2. Expliquer aux chefs de famille réunis le but, les raisons et les modalités des enquêtes à réaliser.
3. Les enquêteurs dûments mandatés pour administrer le questionnaire village doivent procéder à cet exercice.
4. Les autres enquêteurs et enquêtrices doivent travailler en couple au niveau de chaque ménage et procéder aux choix des enquêtés conformément à la distribution faite par l'échantillonnage aléatoire.

F. Comment remplir le formulaire d'enquête.

F1. Dispositions générales

Il faut écrire au crayon de façon appuyée et lisible.

Remplissez toutes les sections du questionnaire.

Si vous n'arrivez pas à compléter une section, notez vos raisons sous la rubrique "Observations Générales" à la fin du questionnaire.

Notez également sous cette rubrique tout ce qui vous semble expliquer mieux les raisons pour lesquelles une question n'a pas obtenu une réponse ou a obtenu une réponse non-satisfaisante.

F2. Remplissage du questionnaire destiné aux chefs de ménages

Page 1: Remplissez attentivement toutes les sections de cette page.

Quest n°1: Combien d'années sans interruption avez-vous vécu dans ce village ?

Si la personne réside dans ce village depuis sa naissance, utilisez le code "99" dans le cas contraire inscrivez le nombre d'années correspondant.

Quest n°2: Quelle est votre ethnie ?

Utilisez également le code et inscrivez l'ethnie désignée par l'enquêté (e).

Quest n°3 Composition du ménage;

Il s'agit de lister les noms de tous les membres du ménage mais s'en tenir seulement à leur prénom; exemple: Fati ou OMAR.

Utilisez les codes pour les colonnes A, B et E.

Pour ce qui est de la colonne C inscrivez le nombre d'années correspondant exemple : 25 ou 12;

Pour la colonne D niveau de scolarité mentionnez la dernière classe réellement terminée par l'intéressé(e).

Par exemple si l'intéressé a juste terminé sa classe de CM1 on inscrit 5; pour la classe de 5e du CEG on inscrit 7 ainsi de suite.

Page 4

Quest n°5 Etez-vous membre d'un groupe villageois, comme un groupe qui travaille avec un projet.....

Pour cette question listez le ou les différents groupes dont est membre l'enquêté(e), écrivez-les dans le tableau avec le code approprié.

Page 5 Sources de revenus

Mentionnez par ordre de priorité et ce de façon décroissante les différentes sources de revenus du ménage dans le tableau correspondant. N'oubliez pas de mentionner le code correspondant dans la partie "code".

Page 6 Sources d'argent

Listez dans le tableau les principales sources de revenus en argent du ménage avec les codes appropriés mais sans ordre de priorité.

Si l'exode et les mandats ne sont pas mentionnés par l'enquêté(e), posez la question de savoir si ces deux choses ne constituent pas pour son ménage une source d'argent?

Possession et Aménagement des champs agricoles

Lisez attentivement cette partie du questionnaire et formuler les questions de manière claire et précise afin d'obtenir les réponses appropriées.

Par exemple à la question "avez vous des champs propres à vous ?". L'enquêté doit pouvoir vous dire exactement l'ensemble des champs qui lui appartiennent.

Insistez pour que l'enquêté(e) vous donne les noms locaux attribués à chaque champ et inscrivez-les dans le tableau. Ensuite utilisez les codes pour toutes les autres questions consécutives. (Mode d'acquisition, type de champ, cultures, exploitant, aménagements etc.)

N'oubliez pas de demander les noms des champs laissés en jachère s'il y en a.

Page 10

Quest n°40: Quelles sont les trois choses dont vous avez besoin pour améliorer votre production....

Listez-les pour les inscrire sur le tableau avec leur code; si par ailleurs l'enquêté(e) ne vous donne que deux besoins au lieu de trois respectez sa réponse et ne le pressez pas à vous donner autant.

Consignes générales concernant tous les tableaux qui suivent:

Le "manque de moyens" que parfois certains enquêtés(es) avancent pour expliquer certaines situations doit être mieux clarifié pour connaître les vraies raisons qui les ont empêché à entreprendre telle ou telle activité. Approfondissez la question pour savoir s'il veut dire par "manque de moyens". manque d'argent, manque de connaissance, d'expérience requise, manque de bras valides, manque de matériel de travail etc...

F3. Comment remplir le questionnaire femmes ?

Page 1: Remplissez méthodiquement la fiche signalitique de cette page.

Page 2: Pour ce qui concerne les groupes villageois auxquels serait membre l'enquêtée, écrivez dans le tableau correspondant tous les groupements ou associations que l'enquêtée viendrait à citer, ainsi que les objectifs qui leur sont assignés.

Page 3: Listez toutes les sources de revenus en argent dans le tableau de cette page.

F4. Possession et Aménagement des champs agricoles.

A ce niveau l'enquêtée ne doit vous donner que les noms des champs qui lui appartiennent effectivement.

Il faut faire beaucoup attention pour ne pas enregistrer les champs prêtés par son mari ou par un autre parent.

La femme ne doit vous donner que les noms des champs qui lui sont propres.

Vous devez donc faire beaucoup attention à la rubrique "mode d'acquisition" de manière à bien élucider la question.

Par exemple ne pas confondre le droit d'usage à long terme conféré à une femme par son époux pour l'exploitation d'un champ et le droit de propriété qui traduit une appropriation définitive d'un champ donné.

Dans la coutume Zarma par exemple, le droit de propriété n'est pas reconnu aux femmes tandis que chez certaines populations il existe des possibilités pour accéder à ce droit.

F5. Listes des techniques GRN

Il y a 4 catégories principales des ressources locales pour lesquelles le pré-test veut disposer des informations pertinentes sur leurs modes de gestion; il s'agit des catégories suivantes: les champs, les arbres, le pâturage et l'eau.

La liste des techniques est présentée par ordre alphabétique en français. Il y a lieu de porter à votre connaissance que vous pouvez rencontrer certaines techniques dans plusieurs catégories. Par exemple on peut trouver "brise-vent" aussi bien dans la catégorie des arbres que des champs.

Il faut toujours chercher la technique dans la catégorie la plus appropriée.

Toutefois les numéros attribués aux différentes techniques demeurent toujours les mêmes quelque soit par ailleurs sa répétition dans le lexique.

S'agissant de certaines techniques qui ne figureraient pas sur la liste, inscrivez-les dans le tableau et discutez après l'enquête avec votre superviseur.

La catégorie "produits phytosanitaires" inclue les fongicides, les pesticides, les insecticides etc..;

Par ailleurs les techniques les plus couramment utilisées sont:

- **fumier:** (produit au village et transporté au champ)
- **parcage:** pratique qui consiste à garder des animaux dans le champ en vue de produire de la fumure organique.
- **semences améliorées:** Ce sont des semences sélectionnées pour donner des bons rendements dans un milieu donné.
- **scarifiage manuel:** Opération qui consiste à ameublir légèrement le sol.
- **labour et pré-labour** (avec utilisation d'animaux de trait): Opération destinée à assurer l'ameublissement de la couche superficielle du sol qui est retournée; elle permet également l'enfouissement des débris végétaux et le déterrage des racines indésirables. En outre elle peut favoriser une meilleure utilisation des réserves hydriques et minérales du sol.
- **demi-lune:** Ouvrage anti-érosif destiné à améliorer l'infiltration de l'eau;
- **élagage:** Opération visant à diminuer les branchages des arbres en vue de favoriser leur croissance;
- **défrichage:** Opération consistant à préparer les champs pour les cultures;
- **mini-barrage:** Ouvrage réalisé sur les bassins versants en vue de réduire la vitesse des eaux et de les collecter;

TERMES CLES

Français	Hausa	Zarma
Activité économique	Aiki maï anfani	Goy albarkanté
Champ dunaire	Jigawa	Hondo
Chef de ménage	Maïgida	Windi koyo
Code rural	Tsarin karkara	Labo sagon
Communauté rurale	Jamâa karkara	Labo jamâa
Crédit formel	Tabatacen bashi	Graw kuku
Crédit informel	Bashin katari	Alwato graw
Cultures maraîchères	Aikin lambu	Gyau farmi
Cultures vivrières	Cimaka	
Cultures de rente	Noman sayarwa	
Cuvette	Fadama	Ganda farey
Délai de remboursement	Lokocin biyan bashi	Goraw banayan alwato
Enquête	Bincike	konkoso
Exode	Bida	Yanma koyan
Fertilité du sol	Karfin gona	Labo albarkanté
Fumier	Takin galgajia	Alman birgi
Gestion des ressources naturelles	Tatalin arzikin karkara	Labo arzaka hawzuyan
Jardinage	Aïkin lambu	Gyau farmi
Ménage	Gida	Windi
Petit commerce	Saye da saydawa	Nerandi
Périmètre irrigué	Gandari	Rugga
Première femme	Worgida	Wande beri
Récolte	Anfani damana	Kaïdiya albarka
Robinet	Pompo	Pompo
Saison sèche	Rani	Heeyni
Saison des pluies	Damana	Kaïdiya

Français	Hausa	Zarma
Semences améliorée	Iri maigawgawa	Dumi wasa
Taux d'intérêt		
Technique de GRN	Dubara tatalin arzikin karkara	Dabari ganga labo arzaka hawzu
Terre empruntée	Gona aro	Hiyan fari
Terre louée	Gona haya	Tolme ffari
Terroir	Karkara	Labo
Votre terre	Gonarka	Bumbo fari
Mil	Haci	Hayni
Sorgho	Dawa	Hamo
Riz	Cinkafa	Moo
Maïs	Masara	Kolkoti
Fonio	Ntaya	Ginsi
Droit foncier		
Bas-fond	Fadama	Tanka
Main d'oeuvre	Lebra	Goyize
Fourrage	Ciyawa	Alman subu
Limite de champ	Iyaka	Fari hiro
Champ individuel	Gamana	Kurga
Champ collectif	Gandu	Windi fari
Services techniques	Ma-aikatar Gomnati	Gomnati saruse

LEXIQUE DES PLANTES

Noms Latins	Hausa	Zarma
Zizyphus	Magaria	Darey
Balanites	Adua	Garbey
Grewia Bicolor	Dargaza	Tamarza
Sclerocarya Birrea	Danya	Danai
Maerua Crassifolia		Hasu
Cadaba Farinosa	Bagey	Bagey
Urena Lobata	Rama	Rama
Hibiscus Sabdariffa	Yakua	Gisima
Morenga Oleifera	Elmaca	Windi bundu
Panicum Laetum	Garji	Gansi
Guiera Senegalensis	Sabara	Sabara
Cassia Sieberiana	Malga	Sinsan
Crotolaria Arenaria	Kilsan rago	Feguimani
Mitragyna Inermis	Kabe	Kabey
Cassia Tora	Tafassa	Ula
Combretum Micrantum	Gueza	Kubu

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ANNEX E
SURVEY QUESTIONNAIRES IN ENGLISH

HEAD OF HOUSEHOLD QUESTIONNAIRE

NRM Survey Pre-Test
USAID/NRMA and C/GRN
Niger, 1995

Department _____

Arrondissement _____

Canton _____

Village _____

Project _____

Date (day, month, year) _____

Enumerator _____

Household No. _____

I. HOUSEHOLD DEMOGRAPHIC COMPOSITION

Name of Household Head: _____

Name of wife (wives): _____

1. How many years have you lived in this village without interruption?
89=entire life
2. What is your ethnic group?

1=Haoussa, 2=Djerma/Songhai, 3=Fulani, 4=Kanouri, 5=Arab, 6=Toubou, 7=Gourmantché,
8=Touareg, 97=other, 98=don't know, 99=no response.

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3. Household Composition:

Please give the names of persons who usually reside in your concession and work in your collective fields, beginning with yourself.

Ask the following questions for each member of the household:

- a. Sex: Is (NAME) male or female?
- b. Age: Is (NAME) 15 years old or older? Put a "1" in the corresponding column.
- c. Education level: How many years of formal (French) school has (NAME) completed?
- d. Literacy: Does (NAME) read and write any language well?

No.	First Name	a. Sex 1=male 2=female	b. Age: less than 15 years	b. Age: more than 15 years	c, No. years French School	d. Literate in which language
1.	Head of Household	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Literate in: 0=illiterate, 1=Haoussa, 2=Djerma, 3=Fulani, 4=Kanouri, 5=Arabic, 6=Toubou, 7=Gourmantché, 8=Tamashek, 97=other, 98=don't know, 99=no response.

3. Household Composition: (continued).

Please give the names of persons who usually reside in your concession and work in your collective fields, beginning with yourself.

Pose the following questions for each member of the household:

- a. Sex: Is (NAME) male or female?
- b. Age: Is (NAME) 15 years old or older? Put a "1" in the corresponding column.
- c. Education level: How many years of formal (French) school has (NAME) completed?
- d. Literacy: Does (NAME) read and write any language well?

No.	First Name	a. Sex 1= male 2= female	b. Age: less than 15 years	b. Age: more than 15 years	c. No. years French school	d. Literate in which language
19.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Literate in: 0=illiterate, 1=Haoussa, 2=Djerma, 3=Fulani, 4=Kanouri, 5=Arabic, 6=Toubou, 7=Gourmantché, 8=Tamashek, 97=other, 98=don't know, 99=no response.

4. How many members of your household went on seasonal migration (exode) last year?

II. SOURCES OF HOUSEHOLD INCOME

A. Principal Economic Activities

5. What is the principal economic activity of household members?
 - a. What is the second most important economic activity?
 - b. What is the third most important, fourth, etc.

6. If migration is not mentioned, ask:
 Is migration an important source of household economic support? If yes, place the response in the following table.

Order of Importance	Economic Activity (write)	Code
1. Most important activity		_ _
2. 2nd most important activity		_ _
3. 3rd most important activity		_ _
4. 4th most important activity		_ _
5. 5th most important activity		_ _
6. 6th most important activity		_ _

Codes:

Activity: 1=rainfed agriculture, 2=livestock production, 3=livestock fattening, 4=commerce, 5=migration, 6=money order, 8=paid laborer for project, 9=nursery, 10=fruit orchard, 11=storyteller, 12=marabout, 13=fishing, 14=transport, 15= artisan products, 16=Koranic teacher, 17=day labor, 18=construction (granaries, houses), 19=reparation, 20=permanent salaried employment, 21=sale of wood/charcoal, 22=butcher, 23=vegetable gardening, 24=poultry production, 25=rice production, 26=food sales, 27= artisan services, 28=blacksmith, 29= woodworking, 97=specify, 98=don't know, 99=no response.

B. Sources of Cash Income

7. Last year, what were the household's principal sources of cash income, including income to both men and women?
8. If migration is not mentioned, ask:
 - a. Is migration an important source of revenue in your household?
 - b. Place the response in the following table, if appropriate.
9. If money sent home (remittances) or brought home by relatives is not mentioned, ask:
 - a. Are remittances or money brought home by relatives an important source of cash income for your household?
 - b. Place the response in the following table, if appropriate.

No.	Sources of Cash Income (write)	Source, Code
1.		_____
2.		_____
3.		_____
4.		_____
5.		_____
6.		_____
7.		_____

Codes:

Sale of Agricultural Products: 1=millet, 2=small millet, 3=sorghum, 4=fonio, 5=maize, 6=wheat, 7=cowpea (seed), 8=cowpea (hay), 9=cotton, 10=peanut, 11=rice, 12=onion, 13=sesame, 14=okra, 15=hibiscus, 16=souchet, 17=gardening (including cassava, yam, potato), 18=tobacco, 19=gourds, 20= doum palm products, 21=honey, 22=fruit, 23=bambara nut, 24=sale of forage/hay, 97=specify.

Livestock and fish: 25=sale of animals or animal products, 26=livestock fattening, 27=sale of fish, 28=salaried livestock herding, 29=salaried fishing, 97=specify.

Other: 30=work paid by a project, 31=weaving mats, 32=sale of food, 33=sale of wood/charcoal, 34=transformation of agricultural products (peanut oil), 35=commerce, 36=transport, 37=marabout, 38=storytelling, 39=sale of plants, 40=artisan products, 41=Koranic teacher, 42=day labor, 43=construction (granaries, houses), 44=reparation, 45=permanent salaried employment, 46=migration, 47=money order, 48=traditional pharmacology, 49= wood working, 51=artisan services, 52=blacksmith, 53=butcher, 54=pension, 55= rope maker, 56= sale of milk, 97=specify, 98=don't know, 99=no response.

III. GENERAL INFORMATION

10. Do you have a functional radio? 1=Yes, 2=No
11. Have you listened to radio reports on the price of agricultural products during the last two weeks?
12. During the rainy season, do you regularly listen to radio reports concerning the weather or the state of crops?
13. If yes: on what subjects? 1=Yes, 2=No
- Rainfall
- Locusts
- The state of maturity of crops
- Regional drought
14. Have you heard of the Rural Code?
15. Have you heard discussions of the following topics? 1=Yes, 2=No
- Relationships between farmers and herders
- Security for rural people through knowledge of their land tenure rights
- Settlement of land conflicts
- Other, specify: _____
16. How did you hear about these topics? 1=Yes, 2=No
- Radio
- Village chief
- Canton chief
- Government agents
- Technical agents
- Television
- Villagers
- Other, specify: _____

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17. If from NGO or project agents, from which project or agency?

Project (specify the name) _____

Agency (specify the name) _____ 1=Yes, 2=No

Don't know

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Other, specify: _____

IV. HOUSEHOLD AGRICULTURAL RESOURCES

- A. Livestock 1 = Yes, 2 = No
18. Do you own any cattle, including animals taken care of by a herder?
19. Do you own any camels?
20. Do you own any goats?
21. Do you own any sheep?
22. Do you own any horses?
23. Do you own any donkeys?
24. Do you own any poultry?
25. How many traction animals do you have?

Traction Animals	Number
Oxen	_ _ _ _
Camels	_ _ _ _
Donkeys	_ _ _ _

B. Land Ownership, Men

26. Do you own land? 1 = Yes, 2 = No
If the answer is NO: Go to question 35.
27. How many fields that belong to you did you cultivate last year?
What are their names? WRITE THE FIELDS' NAMES in the column labeled "Name of field" in the table on the next page.
28. Did you leave any of your fields fallow last year? 1 = Yes, 2 = No
29. If yes, how many fields did you leave fallow?
WRITE THE FIELDS' NAMES in the table.

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30. Did you rent, loan, give, or allow someone else to sharecrop any of your fields last year? 1=Yes, 2=No
31. If yes: how many of your fields did you rent, loan, give, or allow someone else to sharecrop?
What are their names? WRITE THE FIELDS' NAMES in the table.
32. How many fields do you own, in total? VERIFY based on the preceding information.
33. Do you have the right to plant fruit trees in your fields, if you wish? . 1=Yes, 2=No
34. Do you have the right to dig wells in your fields, if you wish? 1=Yes, 2=No
35. Last year, did you cultivate any fields that you rented, borrowed, were given, or sharecropped? 1=Yes, 2=No
36. If yes, how many rented, borrowed, given, or sharecropped fields did you cultivate?
What are their names?
WRITE the fields' names in the column labeled "Name of field."
37. Ask the following questions for EACH FIELD listed in the table:
a. How did you acquire (NAME of field): inherit, buy, borrow, gift, or...?
b. What type of field is it: dune, lowland, plateau, irrigated perimeter, or...?
c. What crops did you cultivate in the field last year?
d. Who worked (exploited) the field last year?
38. Ask the following questions ONLY for COLLECTIVE fields or MEN'S individual fields:
a. Last year, did you do anything in the field (NAME) to improve soil fertility and improve your harvest?
b. Last year, did you do anything to conserve water or control erosion in the field (NAME)?
Use the List of Codes for NRM Techniques
39. Did you maintain trees in the field? Bushes in the field? Use the LIST of CODES.
40. Did you maintain trees around the field? Bushes around the field? Use the LIST of CODES.

41. Last year did you use any of the following in the field (NAME):
- Chemical fertilizer?
 - Improved seed? Use the CODES.
 - Chemicals to control weeds? (herbicides)
 - Chemicals to control insects? (pesticides)

No	Name of Field	a. Acquis.	b. Type	c.					d. Exploit.	NRM Techniques, use the CODES									
				Crops															
1.																			
2.																			
3.																			
4.																			
5.																			
6.																			
7.																			
8.																			
9.																			
10.																			
11.																			
12.																			

Codes:

Acquisition: 1=inheritance, 2=purchase, 3=clearing the field ("right of the axe"), 4=loaned by husband, 5=given by husband, 6=given by a relative, 7=given by a non-relative, 8=loaned by a relative, 9=loaned by a non-parent, 10=allocated by the state, 11=in the concession, 12=women's collective field or garden, 13=rented, 14=sharecropped, 15=inherited by usufruct, 97=other, 98=don't know, 99=no response.

Type of field: 1=dune, 2=plateau, 3=valley, 4=lowland, 5=irrigated perimeter, 6=dallol, 7=depression, 8=hardpan, 9=in the concession, 97=other, 99=no response.

Crops: 1=millet, 2=sorghum, 3=cowpea, 4=maize, 5=peanut, 6=rice, 7=sesame, 8=okra, 9=garden vegetables (including cassava, yam, potato), 10=hibiscus, 11=fonio, 18=bambara nut, 19=cotton, 20=wheat, 21=onion, 22=souchet, 23=fruit orchard, 24=fallow, 25=a portion in fallow, 97=other, 99=no response.

Exploiter: 1=collective (household) field, 2=man's individual field, 3=woman's individual field, 4=women's collective field, 5=worked by someone else, 97=other, 99=no response.

V. MANAGEMENT OF AGRICULTURAL FIELDS

A. NRM Techniques Used in Agricultural Fields

NOTE: List all the NRM techniques that you recorded in the preceding table in the table below.

USE THE LIST OF CODES for NRM TECHNIQUES.

42. Ask the following questions for each NRM technique:
- a. How did you learn this technique?
 - b. What are your reasons for using it?

No.	Techniques (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for Using	Code, Reasons
1.			_____		_____ .. _____
2.			_____		_____ .. _____
3.			_____		_____ .. _____
4.			_____		_____ .. _____
5.			_____		_____ .. _____
6.			_____		_____ .. _____
7.			_____		_____ .. _____
8.			_____		_____ .. _____
9.			_____		_____ .. _____
10.			_____		_____ .. _____

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=state technical agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women's group, 13=radio, 97=other, 98=don't know, 99=no response.

Reasons: 1=fertilize soil and increase production, 2=fertilize soil, 3=increase production, 4=protect against insects, 5=precocious varieties/mature rapidly, 6=increase agricultural area, 7=windbreak, 8=diversify sources of manure, 9=against desertification, 10=favor water infiltration, 11=shade, 12=produce wood, 13=delimit field, 14=live fence, 15=soil improvement/recovery, 16=control erosion, 17=required by law, 18=clean the field, 19=control water, 20=protection, 21=fruit production, 22=livestock fodder, 23=save time, 24=water retention, 97=specify, 98=don't know, 99=no response.

B. NRM Techniques Known (Not Used) in Agricultural Fields

43. In addition to the techniques that you cited, do you know other techniques to improve the fertility of your fields and increase your production, even if you do not use them? . . 1=Yes, 2=No
44. In addition to the techniques that you cited, do you know other techniques to conserve water or control erosion in your fields, even if you do not use them? 1=Yes, 2=No
45. Ask the following questions about each technique listed:
- How did you learn this technique?
 - What are your reasons for not using it?

No.	Techniques Known (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for Not Using	Code, Reasons
1.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
2.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
3.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
4.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
5.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
6.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
7.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
8.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
9.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
10.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=state technical agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women's group, 13=radio, 97=other, 98=don't know, 99=no response.

Reasons: 1=field is still productive, 2=not necessary, 4=lack means of transportation, 5=requires additional manual labor, 6=lack time, 7=lack cash, 8=input not available, 9=lack land/space, 10=men's work, 11=lack equipment/materials, 12=not well enough understood, 13=lack technical assistance, 14=lack livestock, 15=attracts birds, 16=prohibited/fines, 17=not advantageous, 18=lack water, 19=avoid bush fires, 97=other, 98=don't know, 99=no response.

C. Investments in NRM

NOTE: the normal agricultural activities are excluded: field preparation, planting, reseeding, weeding, and harvest.

46. Last year, did you hire any labor to do the NRM techniques cited in your agricultural fields? 1=Yes, 2=No
47. Did you pay the hired labor paid in cash? 1=Yes, 2=No
48. If yes, what was the total cash amount in CFA? _____
49. Did you pay for the hired labor in kind? 1=Yes, 2=No
50. Last year, how much did you spend on agricultural inputs?

No.	Inputs	Amount in CFA
1.	Chemical fertilizer	_____
2.	Improved seed	_____
3.	Pesticides	_____
4.	Herbicides	_____

51. What are the three things that you most need to improve your agricultural production?

No.	Needs (write)	Code
1.		_____
2.		_____
3.		_____

Needs: 1=manure, 2>manual labor on time, 3=good rainfall, 4=fertilizer, 5=striation/cultivation, 6=labor, 7=pesticides, 8=tree planting, 9=improved seeds, 10=animal traction, 11=soil improvement, 12=credit, 13=motor pump, 14=mulching, 15=cart, 16=plow, 17=money, 18=agricultural equipment, 19=fuel, 97=other, 98=don't know, 99=no response.

VI. TREE MANAGEMENT

A. NRM Techniques Used with Trees

52. Does your household do anything to manage the trees that belong to you? 1=Yes, 2=No
53. Does your household do anything to manage communal trees or forest resources? 1=Yes, 2=No
54. Please list for us ALL the tree management techniques that you use.
 Do you have: A family woodlot or orchard?
 Live fences or windbreaks?
 Trees or bushes in the concession for some purpose?
55. Ask the following questions about each technique cited:
 a. How did you learn this technique?
 b. What are your reasons for using it?

No.	Technique (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for Using	Code, Reasons
1.			_____		_____ .. _____
2.			_____		_____ .. _____
3.			_____		_____ .. _____
4.			_____		_____ .. _____
5.			_____		_____ .. _____
6.			_____		_____ .. _____
7.			_____		_____ .. _____
8.			_____		_____ .. _____
9.			_____		_____ .. _____

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=state technical agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women's group, 13=radio, 97=other, 98=don't know, 99=no response.

Reasons: 1=control erosion, 2=improve soil fertility, 3=control water, 4=improve the quality of fruit trees, 5=growth/maintenance, 6=control cutting, 7=windbreak, 8=increase the number of trees, 9=protection, 10=shade, 11=produce wood, 12=prohibited/fines, 13=for the fruit, 14=delimit field, 15=soil/field recovery, 16=reforestation, 17=trekking route, 18=live hedge, 19=against desertification, 20=prevent bush fires, 21=field clearing, 22=livestock feed, 23=save time, 24=improve water infiltration, 25=traditional pharmacology, 26=reduce wood consumption, 27=generate income, 28=restore the environment, 97=specify, 98=don't know, 99=no response.

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B. NRM Techniques Known (Not Used) with Trees

56. In addition to the techniques that you cited, do you know other techniques to manage of trees, even if you do not use them? 1=Yes, 2=No
57. Ask the following questions about each technique:
 a. How did you learn about this technique?
 b. What are your reasons for not using it?

No.	Techniques Known (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for Not Using	Code, Reasons
1.			_____		_____ .. _____
2.			_____		_____ .. _____
3.			_____		_____ .. _____
4.			_____		_____ .. _____
5.			_____		_____ .. _____
6.			_____		_____ .. _____
7.			_____		_____ .. _____
8.			_____		_____ .. _____
9.			_____		_____ .. _____
10.			_____		_____ .. _____

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=gov. technical service agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women's group, 13=radio, 97=other, 98=don't know, 99=no response.

Reasons: 1=lack of water, 2=lack labor, 3=lack time, 4=prohibited/fines, 5=lack land, 6=not necessary, 7=men's work, 8=responsibility of head of household, 9=lack cash, 10=lack equipment/material, 11=lack means of transportation, 12=don't understand, 13=lack of technical assistance, 14=lack nursery, 15=attracts birds, 16=theft, 17=animal damage, 18=no fruit orchard, 19=not advantageous, 20=responsibility of (gov.) technical services, 21=no pay/incentive, 97=other, 98=don't know, 99=no response.

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VII. PASTURE MANAGEMENT

A. NRM Techniques Used with Pasture

58. Do you use a portion of your land for pasture only? 1=Yes, 2=No
59. Do you use communal lands for pasture? 1=Yes, 2=No
60. Please list for us ALL the techniques that you use to manage pasture land.
Do you do anything to increase the production of forage on pasture land?
Do you do anything to improve the quality of forage produced on pasture land?
61. Ask the following questions about each technique mentioned:
a. How did you learn this technique?
b. What are your reasons for using it?

No.	Technique (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for Using	Code, Reasons
1.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
2.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
3.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
4.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
5.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
6.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
7.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
8.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
9.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
10.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=state technical agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women's group, 13=radio, 97=other, 98=don't know, 99=no response.

Reasons: 1=increase the area of pasture land, 2=restore the environment, 3=manage/improve livestock feed, 4=deposit manure in the field, 5=improve livestock growth, 6=improve pasture, 7=protection, 8=avoid animal damage, 9=sale of forage/hay, 97=other, 98=don't know, 99=no response.

B. NRM Techniques Known (Not Used) with Pasture

62. In addition to the techniques that you cited, do you know other techniques to improve the management of pasture, even if you do not use them? 1=Yes, 2=No
63. Ask the following questions about each technique:
- How did you learn about this technique?
 - What are your reasons for not using it?

No.	Techniques Known (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for Not Using	Code, Reasons
1.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
2.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
3.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
4.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
5.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
6.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
7.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
8.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
9.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
10.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=state technical agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women's group, 13=radio, 97=other, 98=don't know, 99=no response.

Reasons: 1= no livestock, 2=not necessary, 3=lack space/land, 4=lack means of transportation, 5=lack cash, 6=men's work, 7=lack time, 8=lack equipment/material, 9=lack labor, 10=don't understand, 11=lack technical assistance, 12=lack seed, 13=requires lots of water, 14=prohibited/fines, 15=lack of consensus, 16=appropriate species not available, 17=inputs not available, 19=not advantageous, 20=responsibility of (gov.) technical services, 97=other, 98=don't know, 99=no response.

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VIII. WATER MANAGEMENT

A. NRM Techniques Used with Water

64. Do you do anything to manage water, for agricultural production, for your livestock, or for your drinking water? 1=Yes, 2=No
65. Please list for us ALL the techniques that you use to manage water.
66. Ask the following questions about each technique mentioned:
 a. How did you learn this technique?
 b. What are your reasons for using it?

No.	Technique (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for Using	Code, Reasons
1.			_ _ _ _		_ _ _ _ .. _ _ _ _
2.			_ _ _ _		_ _ _ _ .. _ _ _ _
3.			_ _ _ _		_ _ _ _ .. _ _ _ _
4.			_ _ _ _		_ _ _ _ .. _ _ _ _
5.			_ _ _ _		_ _ _ _ .. _ _ _ _
6.			_ _ _ _		_ _ _ _ .. _ _ _ _
7.			_ _ _ _		_ _ _ _ .. _ _ _ _
8.			_ _ _ _		_ _ _ _ .. _ _ _ _
9.			_ _ _ _		_ _ _ _ .. _ _ _ _
10.			_ _ _ _		_ _ _ _ .. _ _ _ _

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=gov. technical service agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women's group, 13=radio, 97=other, 98=don't know, 99=no response.

Reasons: 1=control water, 2=increase water capacity, 3=hygiene, 4=control erosion, 5=clear area, 6=water conservation, 7=improve water infiltration, 8=avoid accidents, 9=reparation, 10=protection, 11=evacuate water, 12=water retention, 97=other, 98=don't know, 99=no response.

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B. Management Techniques Known (Not Used) with Water

67. In addition to the techniques that you cited, do you know other techniques to manage water, even if you do not use them? 1=Yes, 2=No
68. Ask the following questions about each technique:
 a. How did you learn about this technique?
 b. What are your reasons for not using it?

No.	Techniques Known (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for Not Using	Code, Reasons
1.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
2.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
3.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
4.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
5.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
6.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
7.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
8.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
9.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
10.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=state technical agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women's group, 13=radio, 97=other, 98=don't know, 99=no response.

Reasons: 1=not necessary, 2=lack equipment/materials, 3=men's work, 4=lack time, 5=lack cash, 6=lack means of transportation, 7=lack land/space, 8=don't understand, 9=lack technical assistance, 10=lack seed, 11=lack labor, 12=field is distant, 13=lack water, 97=other, 98=don't know, 99=no response.

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IX. ACCESS TO CREDIT

A. Cash Credit

69. Last year, did you obtain any CASH credit? 1=Yes, 2=No
70. If yes: how many times during the year?
71. If yes: ask these questions about each credit in CASH obtained:
- a. What was the source of credit?
 - b. Was it individual or group credit?
 - c. What did you do with the credit?
 - d. What was the amount of in CFA?
 - e. What was the amount you repaid?
 - f. What was the repayment period (in months)?

No	a. Source	b. Individual=1 Group=2 Both=3	c. Use of Credit	d. Amount in CFA	e. Reimbursement in CFA	f. Loan Period (months)
1.	<input type="text"/>	<input type="text"/>	<input type="text"/> .. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
2.	<input type="text"/>	<input type="text"/>	<input type="text"/> .. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
3.	<input type="text"/>	<input type="text"/>	<input type="text"/> .. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4.	<input type="text"/>	<input type="text"/>	<input type="text"/> .. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
5.	<input type="text"/>	<input type="text"/>	<input type="text"/> .. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
6.	<input type="text"/>	<input type="text"/>	<input type="text"/> .. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Codes:

Source: 1=project, 2=government agency, 3=Caisse Populaire de Crédit, 4=CLUSA, 5=WOCCU, 6=CARE, 7=another NGO, 8= cooperative, 9=individual, 10=private sector agency, 11=bank, 12= merchant, 13=spouse, 14=village group, 97=other, 98=don't know, 99=no response.

Use of credit: 1=livestock production, 2=livestock fattening, 3=modern agricultural inputs, 4=local seed, 5=agricultural production, 6=health, 7=seedling nursery, 8=commerce, 9=food, 10=natural resource management, 12=traditional ceremonies, 13=clothes, 14=travel, 15=family needs, 16=hire manual labor, 17=manure, 18=transportation, 19=agricultural equipment, 20=sell animal products, 21= food vending, 97=other, 98=don't know, 99=no response.

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B. Credit in Kind

72. Last year, did you obtain any credit IN KIND for agricultural production or natural resource management? 1=Yes, 2=No

73. If yes: how many times during the year?

74. If yes: ask these questions about each credit IN KIND obtained:
- a. What was the source of the credit?
 - b. What type of credit was it?
 - c. How much did you repay in CFA or what was the value of the goods you returned in CFA?
 - d. What was the repayment period (in months)?

No.	a. Source	b. Type of Credit	c. Reimbursement or Value in CFA	d. Loan Period (months)
1.	<input type="text"/>	<input type="text"/> .. <input type="text"/>	<input type="text"/>	<input type="text"/>
2.	<input type="text"/>	<input type="text"/> .. <input type="text"/>	<input type="text"/>	<input type="text"/>
3.	<input type="text"/>	<input type="text"/> .. <input type="text"/>	<input type="text"/>	<input type="text"/>
4.	<input type="text"/>	<input type="text"/> .. <input type="text"/>	<input type="text"/>	<input type="text"/>
5.	<input type="text"/>	<input type="text"/> .. <input type="text"/>	<input type="text"/>	<input type="text"/>
6.	<input type="text"/>	<input type="text"/> .. <input type="text"/>	<input type="text"/>	<input type="text"/>

Codes:

Source: 1=project, 2=government agency, 3=Caisse Populaire de Crédit, 4=CLUSA, 5=WOCU, 6=CARE, 7=another NGO, 8= cooperative, 9=individual, 10=private sector org., 11=bank, 12= merchant, 13=spouse, 14=village group, 97=other, 98=don't know, 99=no response.

Type of credit: 1=modern agricultural inputs (fertilizer, improved seed, pesticides), 2=local seed, 3=food, 4=manure, 5= agricultural equipment, 6=transportation, 7=livestock, 8=basic consumer goods, 9=labor, 10=household goods, 11=commerce, 12=family needs, 13=fuel, 97=other, 98=don't know, 99=no response.

WOMEN'S QUESTIONNAIRE

NRM Survey Pre-Test
USAID/NRMA and C/GRN
Niger, 1995

Department _____

Arrondissement _____

Canton _____

Village _____

Project _____

Date (day, month, year) _____

Enumerator _____

Household No. _____

Woman's number in household demography table _____

Name of household head: _____

Name of woman interviewed: _____

I. DEMOGRAPHIC INFORMATION

1. How many years have you lived in this village without interruption?
89=entire life
2. What is your ethnic group?

1=Haoussa, 2=Djerma/Songhai, 3=Fulani, 4=Kanouri, 5=Arab, 6=Toubou, 7=Gourmantché,
8=Touareg, 97=other, 98=don't know, 99=no response.

II. SOURCES OF CASH INCOME

3. Last year, what were your principal sources of cash income?

No.	Sources of Cash Income (write)	Source, Code
1.		_____
2.		_____
3.		_____
4.		_____
5.		_____
6.		_____
7.		_____

Codes:

Sale of Agricultural Products: 1=millet, 2=small millet, 3=sorghum, 4=fonio, 5=maize, 6=wheat, 7=cowpea (seed), 8=cowpea (hay), 9=cotton, 10=peanut, 11=rice, 12=onion, 13=sesame, 14=okra, 15=hibiscus, 16=souchet, 17=gardening (including cassava, yam, potato), 18=tobacco, 19=gourds, 20= doum palm products, 21=honey, 22=fruit, 23=bambara nut, 24=sale of forage/hay, 97=specify.

Livestock and fish: 25=sale of animals or animal products, 26=livestock fattening, 27=sale of fish, 28=salaried livestock herding, 29=salaried fishing, 97=specify.

Other: 30=work paid by a project, 31=weaving mats, 32=sale of food, 33=sale of wood/charcoal, 34=transformation of agricultural products (peanut oil), 35=commerce, 36=transport, 37=marabout, 38=storytelling, 39=sale of plants, 40=artisan products, 41=Koranic teacher, 42=day labor, 43=construction (granaries, houses), 44=reparation, 45=permanent salaried employment, 46=migration, 47=money order, 48=traditional pharmacology, 49= wood working, 51=artisan services, 52=blacksmith, 53=butcher, 54=pension, 55= rope maker, 56= sale of milk, 97=specify, 98=don't know, 99=no response.

III. GENERAL INFORMATION

1 = Yes, 2 = No

4. Have you listened to radio reports on the price of agricultural products during the last two weeks?

5. During the rainy season, do you regularly listen to radio reports concerning the weather or the state of crops?

6. If yes: on what subjects? 1 = Yes, 2 = No

Rainfall

Locusts

The state of maturity of crops

Regional drought

7. Have you heard of the Rural Code?

8. Have you heard discussions of the following topics? 1 = Yes, 2 = No

Relationships between farmers and herders

Security for rural people through knowledge of their land tenure rights

Settlement of land conflicts

Other, specify: _____

9. How did you hear about these topics? 1 = Yes, 2 = No

Radio

Village chief

Canton chief

Government agents

Technical agents

Television

Villagers

Other, specify: _____

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10. If from NGO or project agents, from which project or agency?

Project (specify the name) _____

Agency (specify the name) _____ 1=Yes, 2=No

Don't know

RIDD FITILA

Other, specify: _____

IV. OWNERSHIP OF AGRICULTURAL FIELDS, WOMEN

11. Do you own any agricultural fields? 1=Yes, 2=No
12. If yes: do you have the right to plant fruit trees in your fields, if you wish? . 1=Yes, 2=No
13. If yes: do you have the right to dig wells in your fields, if you so desire? . . 1=Yes, 2=No
14. If yes: does your husband have the right to reclaim your fields, if he wishes? 1=Yes, 2=No
15. How many fields do you own?
16. What are their names? WRITE THE NAMES in the column labeled "Name of field" on the following page.
17. Last year, did you cultivate any parcels in your husband's fields? 1=Yes, 2=No
18. If yes: how many parcels did you cultivate?
WRITE THE NAMES in the column labeled "Name of field."
19. Last year, did you cultivate anything in the concession? 1=Yes, 2=No
If yes, WRITE "concession" in the column labeled "Name of field."
20. Last year, did you cultivate in a women's collective field? 1=Yes, 2=No
If yes, WRITE "collective field" in the column labeled "Name of field."
21. Last year, did you cultivate in a women's collective garden? 1=Yes, 2=No
If yes, WRITE "garden" in column labeled "Name of field."
22. Did you cultivate any other fields, last year? 1=Yes, 2=No
23. If yes: how many other fields did you cultivate?
WRITE THE NAMES of the FIELDS in the table.
24. Ask the following questions for EACH FIELD listed in the table:
 - a. How did you acquire (NAME of field): loaned by your husband, with a group of women, or ...?
 - b. What type of field is it: dune, lowland, plateau, irrigated or...?
 - c. What crops did you cultivate in the field (NAME) last year?
 - d. Who worked (exploited) field (NAME) last year?
25. Ask the following questions about EACH FIELD cultivated by the woman:
 - a. Last year, did you do anything in the field (NAME) to improve soil fertility and improve your harvest?
 - b. Last year, did you do anything to conserve water or control erosion in the field (NAME)?
Use the List of Codes for NRM Techniques
26. Did you maintain trees in the field? Bushes in the field? Use the LIST of CODES.
27. Did you maintain trees around the field? Bushes around the field? Use the LIST of CODES.

28. Last year did you use any of the following in the field (NAME):
- a. Chemical fertilizer?
 - b. Improved seed? Use the CODES.
 - c. Chemicals to control weeds? (herbicides)
 - d. Chemicals to control insects? (pesticides)

No.	Name of Field	a. Acquis.	b. Type	c.				d. Exploit.	NRM Techniques, use the CODES										
				Crops															
1.																			
2.																			
3.																			
4.																			
5.																			
6.																			
7.																			
8.																			
9.																			
10.																			
11.																			
12.																			

Codes:

Acquisition: 1=inheritance, 2=purchase, 3=clearing the field ("right of the axe"), 4=loaned by husband, 5=given by husband, 6=given by a relative, 7=given by a non-relative, 8=loaned by a relative, 9=loaned by a non-parent, 10=allocated by the state, 11=in the concession, 12=women's collective field or garden, 13=rented, 14=sharecropped, 15=inherited by usufruct, 97=other, 98=don't know, 99=no response.

Type of field: 1=dune, 2=plateau, 3=valley, 4=lowland, 5=irrigated perimeter, 6=dallol, 7=depression, 8=hardpan, 9=in the concession, 97=other, 99=no response.

Crops: 1=millet, 2=sorghum, 3=cowpea, 4=maize, 5=peanut, 6=rice, 7=sesame, 8=okra, 9=garden vegetables (including cassava, yam, potato), 10=hibiscus, 11=fonio, 18=bambara nut, 19=cotton, 20=wheat, 21=onion, 22=souchet, 23=fruit orchard, 24=fallow, 25=a portion in fallow, 97=other, 99=no response.

Exploiter: 1=collective (household) field, 2=man's individual field, 3=woman's individual field, 4=women's collective field, 5=worked by someone else, 97=other, 99=no response.

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V. MANAGEMENT OF AGRICULTURAL FIELDS

A. NRM Techniques Used in Agricultural Fields

NOTE: List all the NRM techniques that you recorded in the preceding table in the table below.

USE THE LIST OF CODES for NRM TECHNIQUES.

29. Ask the following questions for each NRM technique:

- a. How did you learn this technique?
- b. What are your reasons for using it?

No.	Techniques (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for Using	Code, Reasons
1.			_ _ _		_ _ _ .. _ _ _
2.			_ _ _		_ _ _ .. _ _ _
3.			_ _ _		_ _ _ .. _ _ _
4.			_ _ _		_ _ _ .. _ _ _
5.			_ _ _		_ _ _ .. _ _ _
6.			_ _ _		_ _ _ .. _ _ _
7.			_ _ _		_ _ _ .. _ _ _
8.			_ _ _		_ _ _ .. _ _ _
9.			_ _ _		_ _ _ .. _ _ _
10.			_ _ _		_ _ _ .. _ _ _

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=state technical agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women's group, 13=radio, 97=other, 98=don't know, 99=no response.

Reasons: 1=fertilize soil and increase production, 2=fertilize soil, 3=increase production, 4=protect against insects, 5=precocious varieties/mature rapidly, 6=increase agricultural area, 7=windbreak, 8=diversify sources of manure, 9=against desertification, 10=favor water infiltration, 11=shade, 12=produce wood, 13=delimit field, 14=live fence, 15=soil improvement/recovery, 16=control erosion, 17=required by law, 18=clean the field, 19=control water, 20=protection, 21=fruit production, 22=livestock fodder, 23=save time, 24=water retention, 97=specify, 98=don't know, 99=no response.

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B. NRM Techniques Known (Not Used) in Agricultural Fields

30. In addition to the techniques that you cited, do you know other techniques to improve the fertility of your fields and increase your production, even if you do not use them? 1=Yes, 2=No
31. In addition to the techniques that you cited, do you know other techniques to conserve water or control erosion in your fields, even if you do not use them? 1=Yes, 2=No
32. Ask the following questions about each technique listed:
 a. How did you learn this technique?
 b. What are your reasons for not using it?

No.	Techniques Known (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for Not Using	Code, Reasons
1.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
2.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
3.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
4.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
5.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
6.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
7.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
8.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
9.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
10.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=state technical agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women’s group, 13=radio, 97=other, 98=don’t know, 99=no response.

Reasons: 1=field is still productive, 2=not necessary, 4=lack means of transportation, 5=requires additional manual labor, 6=lack time, 7=lack cash, 8=input not available, 9=lack land/space, 10=men’s work, 11=lack equipment/materials, 12=not well enough understood, 13=lack technical assistance, 14=lack livestock, 15=attracts birds, 16=prohibited/fines, 17=not advantageous, 18=lack water, 19=avoid bush fires, 97=other, 98=don’t know, 99=no response.

C. Investments in NRM

NOTE: the normal agricultural activities are excluded: field preparation, planting, reseeding, weeding, and harvest.

33. Last year, did you hire any labor to do the NRM techniques cited in your agricultural fields? 1=Yes, 2=No
34. Did you pay the hired labor paid in cash? 1=Yes, 2=No
35. If yes, what was the total cash amount in CFA?
36. Did you pay for the hired labor in kind? 1=Yes, 2=No
37. Last year, how much did you spend on agricultural inputs?

No.	Inputs	Amount in CFA
1.	Chemical fertilizer	<input type="text"/>
2.	Improved seed	<input type="text"/>
3.	Pesticides	<input type="text"/>
4.	Herbicides	<input type="text"/>

38. What are the three things that you most need to improve your agricultural production?

No.	Needs (write)	Code
1.		<input type="text"/>
2.		<input type="text"/>
3.		<input type="text"/>

Needs: 1=manure, 2>manual labor on time, 3=good rainfall, 4=fertilizer, 5=striation/cultivation, 6=labor, 7=pesticides, 8=tree planting, 9=improved seeds, 10=animal traction, 11=soil improvement, 12=credit, 13=motor pump, 14=mulching, 15=cart, 16=plow, 17=money, 18=agricultural equipment, 19=fuel, 97=other, 98=don't know, 99=no response.

VI. TREE MANAGEMENT

A. NRM Techniques Used with Trees

39. Does your household do anything to manage the trees that belong to you? 1=Yes, 2=No

40. Does your household do anything to manage communal trees or forest resources? 1=Yes, 2=No

41. Please list for us ALL the tree management techniques that you use.

Do you have: A family woodlot or orchard?

Live fences or windbreaks?

Trees or bushes in the concession for some purpose?

42. Ask the following questions about each technique cited:

a. How did you learn this technique?

b. What are your reasons for using it?

No.	Technique (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for Using	Code, Reasons
1.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
2.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
3.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
4.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
5.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
6.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
7.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
8.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
9.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=state technical agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women's group, 13=radio, 97=other, 98=don't know, 99=no response.

Reasons: 1=control erosion, 2=improve soil fertility, 3=control water, 4=improve the quality of fruit trees, 5=growth/maintenance, 6=control cutting, 7=windbreak, 8=increase the number of trees, 9=protection, 10=shade, 11=produce wood, 12=prohibited/fines, 13=for the fruit, 14=delimit field, 15=soil/field recovery, 16=reforestation, 17=trekking route, 18=live hedge, 19=against desertification, 20=prevent bush fires, 21=field clearing, 22=livestock feed, 23=save time, 24=improve water infiltration, 25=traditional pharmacology, 26=reduce wood consumption, 27=generate income, 28=restore the environment, 97=specify, 98=don't know, 99=no response.

B. NRM Techniques Known (Not Used) with Trees

43. In addition to the techniques that you cited, do you know other techniques to manage of trees, even if you do not use them? 1=Yes, 2=No
44. Ask the following questions about each technique:
 a. How did you learn about this technique?
 b. What are your reasons for not using it?

No.	Techniques Known (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for Not Using	Code, Reasons
1.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
2.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
3.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
4.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
5.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
6.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
7.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
8.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
9.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
10.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=gov. technical service agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women's group, 13=radio, 97=other, 98=don't know, 99=no response.

Reasons: 1=lack of water, 2=lack labor, 3=lack time, 4=prohibited/fines, 5=lack land, 6=not necessary, 7=men's work, 8=responsibility of head of household, 9=lack cash, 10=lack equipment/material, 11=lack means of transportation, 12=don't understand, 13=lack of technical assistance, 14=lack nursery, 15=attracts birds, 16=theft, 17=animal damage, 18=no fruit orchard, 19=not advantageous, 20=responsibility of (gov.) technical services, 21=no pay/incentive, 97=other, 98=don't know, 99=no response.

VII. PASTURE MANAGEMENT

A. NRM Techniques Used with Pasture

45. Do you use a portion of your land for pasture only? 1=Yes, 2=No
46. Do you use communal lands for pasture? 1=Yes, 2=No
47. Please list for us ALL the techniques that you use to manage pasture land.
Do you do anything to increase the production of forage on pasture land?
Do you do anything to improve the quality of forage produced on pasture land?
48. Ask the following questions about each technique mentioned:
a. How did you learn this technique?
b. What are your reasons for using it?

No.	Technique (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for Using	Code, Reasons
1.			_ _ _ _		_ _ _ _ .. _ _ _ _
2.			_ _ _ _		_ _ _ _ .. _ _ _ _
3.			_ _ _ _		_ _ _ _ .. _ _ _ _
4.			_ _ _ _		_ _ _ _ .. _ _ _ _
5.			_ _ _ _		_ _ _ _ .. _ _ _ _
6.			_ _ _ _		_ _ _ _ .. _ _ _ _
7.			_ _ _ _		_ _ _ _ .. _ _ _ _
8.			_ _ _ _		_ _ _ _ .. _ _ _ _
9.			_ _ _ _		_ _ _ _ .. _ _ _ _
10.			_ _ _ _		_ _ _ _ .. _ _ _ _

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=state technical agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women's group, 13=radio, 97=other, 98=don't know, 99=no response.

Reasons: 1=increase the area of pasture land, 2=restore the environment, 3=manage/improve livestock feed, 4=deposit manure in the field, 5=improve livestock growth, 6=improve pasture, 7=protection, 8=avoid animal damage, 9=sale of forage/hay, 97=other, 98=don't know, 99=no response.

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B. NRM Techniques Known (Not Used) with Pasture

49. In addition to the techniques that you cited, do you know other techniques to improve the management of pasture, even if you do not use them? 1=Yes, 2=No

50. Ask the following questions about each technique:

a. How did you learn about this technique?

b. What are your reasons for not using it?

No.	Techniques Known (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for Not Using	Code, Reasons
1.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
2.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
3.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
4.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
5.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
6.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
7.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
8.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
9.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
10.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=state technical agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women's group, 13=radio, 97=other, 98=don't know, 99=no response.

Reasons: 1= no livestock, 2=not necessary, 3=lack space/land, 4=lack means of transportation, 5=lack cash, 6=men's work, 7=lack time, 8=lack equipment/material, 9=lack labor, 10=don't understand, 11=lack technical assistance, 12=lack seed, 13=requires lots of water, 14=prohibited/fines, 15=lack of consensus, 16=appropriate species not available, 17=inputs not available, 19=not advantageous, 20=responsibility of (gov.) technical services, 97=other, 98=don't know, 99=no response.

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VIII. WATER MANAGEMENT

A. NRM Techniques Used with Water

51. Do you do anything to manage water, for agricultural production, for your livestock, or for your drinking water? 1=Yes, 2=No

52. Please list for us ALL the techniques that you use to manage water.

53. Ask the following questions about each technique mentioned:

a. How did you learn this technique?

b. What are your reasons for using it?

No.	Technique (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for Using	Code, Reasons
1.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
2.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
3.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
4.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
5.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
6.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
7.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
8.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
9.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
10.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=gov. technical service agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women's group, 13=radio, 97=other, 98=don't know, 99=no response.

Reasons: 1=control water, 2=increase water capacity, 3=hygiene, 4=control erosion, 5=clear area, 6=water conservation, 7=improve water infiltration, 8=avoid accidents, 9=reparation, 10=protection, 11=evacuate water, 12=water retention, 97=other, 98=don't know, 99=no response.

B. Management Techniques Known (Not Used) with Water

54. In addition to the techniques that you cited, do you know other techniques to manage water, even if you do not use them? 1=Yes, 2=No

55. Ask the following questions about each technique:

a. How did you learn about this technique?

b. What are your reasons for not using it?

No.	Techniques Known (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for Not Using	Code, Reasons
1.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
2.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
3.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
4.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
5.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
6.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
7.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
8.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
9.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>
10.			<input type="checkbox"/>		<input type="checkbox"/> .. <input type="checkbox"/>

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=state technical agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women's group, 13=radio, 97=other, 98=don't know, 99=no response.

Reasons: 1=not necessary, 2=lack equipment/materials, 3=men's work, 4=lack time, 5=lack cash, 6=lack means of transportation, 7=lack land/space, 8=don't understand, 9=lack technical assistance, 10=lack seed, 11=lack labor, 12=field is distant, 13=lack water, 97=other, 98=don't know, 99=no response.

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IX. ACCESS TO CREDIT

A. Cash Credit

56. Last year, did you obtain any CASH credit? 1=Yes, 2=No

57. If yes: how many times during the year?

58. If yes: ask these questions about each credit in CASH obtained:

- a. What was the source of credit?
- b. Was it individual or group credit?
- c. What did you do with the credit?
- d. What was the amount of in CFA?
- e. What was the amount you repaid?
- f. What was the repayment period (in months)?

No	a. Source	b. Individual=1 Group=2 Both=3	c. Use of Credit	d. Amount in CFA	e. Reimbursement in CFA	f. Loan Period (months)
1.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> .. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> .. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> .. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> .. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> .. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> .. <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Codes:

Source: 1=project, 2=government agency, 3=Caisse Populaire de Crédit, 4=CLUSA, 5=WOCCU, 6=CARE, 7=another NGO, 8= cooperative, 9=individual, 10=private sector agency, 11=bank, 12= merchant, 13=spouse, 14=village group, 97=other, 98=don't know, 99=no response.

Use of credit: 1=livestock production, 2=livestock fattening, 3=modern agricultural inputs, 4=local seed, 5=agricultural production, 6=health, 7=seedling nursery, 8=commerce, 9=food, 10=natural resource management, 12=traditional ceremonies, 13=clothes, 14=travel, 15=family needs, 16=hire manual labor, 17=manure, 18=transportation, 19=agricultural equipment, 20=sell animal products, 21= food vending, 97=other, 98=don't know, 99=no response.

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B. Credit in Kind

59. Last year, did you obtain any credit IN KIND for agricultural production or natural resource management? 1=Yes, 2=No

60. If yes: how many times during the year?

61. If yes: ask these questions about each credit IN KIND obtained:

- a. What was the source of the credit?
- b. What type of credit was it?
- c. How much did you repay in CFA or what was the value of the goods you returned in CFA?
- d. What was the repayment period (in months)?

No.	a. Source	b. Type of Credit	c. Reimbursement or Value in CFA	d. Loan Period (months)
1.	<input type="text"/>	<input type="text"/> .. <input type="text"/>	<input type="text"/>	<input type="text"/>
2.	<input type="text"/>	<input type="text"/> .. <input type="text"/>	<input type="text"/>	<input type="text"/>
3.	<input type="text"/>	<input type="text"/> .. <input type="text"/>	<input type="text"/>	<input type="text"/>
4.	<input type="text"/>	<input type="text"/> .. <input type="text"/>	<input type="text"/>	<input type="text"/>
5.	<input type="text"/>	<input type="text"/> .. <input type="text"/>	<input type="text"/>	<input type="text"/>
6.	<input type="text"/>	<input type="text"/> .. <input type="text"/>	<input type="text"/>	<input type="text"/>

Codes:

Source: 1=project, 2=government agency, 3=Caisse Populaire de Crédit, 4=CLUSA, 5=WOCCU, 6=CARE, 7=another NGO, 8= cooperative, 9=individual, 10=private sector org., 11=bank, 12= merchant, 13=spouse, 14=village group, 97=other, 98=don't know, 99=no response.

Type of credit: 1=modern agricultural inputs (fertilizer, improved seed, pesticides), 2=local seed, 3=food, 4=manure, 5= agricultural equipment, 6=transportation, 7=livestock, 8=basic consumer goods, 9=labor, 10=household goods, 11=commerce, 12=family needs, 13=fuel, 97=other, 98=don't know, 99=no response.

VILLAGE QUESTIONNAIRE

NRM Survey Pre-Test
USAID/NRMA and C/GRN
Niger, 1995

Department _____

Arrondissement _____

Canton _____

Village _____

Project _____

Date (day, month, year) _____

Enumerator _____

I. LOCAL INFRASTRUCTURE

1. What are your sources of energy for cooking and lighting? 1=Yes, 2=No
- Wood
- Charcoal
- Kerosene
- Electricity
- Flash light
- Solar Energy
- Millet stalks
- Other, specify: _____

2. Are there any schools in the village? 1 = Yes, 2 = No

None

Primary

Koranic

Functional literacy center

Other, specify:

3. What medical services are available in the village? 1 = Yes, 2 = No

None

Medical center

Dispensary

Maternity

Village pharmacy

Matron

First-aid worker

Other, specify: _____

4. Have any village residents become civil servants? 1 = Yes, 2 = No

5. What are your principal market? _____

6. Pose the following questions about each market:
- How many times per week?
 - How far is the market from here?
 - Is the road to the market asphalted?
 - Is there transport for hire between the village and the market (truck, cart)?

No.	Name of market	No. of times per week	Distance in kms.	Road asphalted 1=yes 2=no	Transport for hire 1=yes 2=no
1.		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. What are the asphalted roads closest to the village (where do they go)?

8. What distance are they from the village (kilometers)?

9. What is the urban center most frequented by the villagers?

10. What distance is it from the village (kilometers)?

11. What are the ethnic groups which live within the village territory?

1=Haoussa, 2=Djerma/Songhai, 3=Fulani, 4=Kanouri, 5=Arabe, 6=Toubou,
7=Gourmantché, 8=Toureg, 97=other, 98=don't know, 99=no response.

12. The majority of villagers belong to which ethnic group?

II. CREDIT

13. List all of the sources of CASH credit available in the village.
14. Pose the following questions about each source of credit:
- a. How many years have you had this source of credit? 89=traditional.
 - b. Does it provide credit to men, women, or both?
 - c. Is the credit individual or collective?
 - d. What do the villagers do with this credit?

No.	Source (write)	Source, Code	How many years	Men=1 women=2 both=3	Indiv.=1 collective=2 both=3	Objectives of Credit, Code
1.		□□□	□□□	□	□	□□□..□□□
2.		□□□	□□□	□	□	□□□..□□□
3.		□□□	□□□	□	□	□□□..□□□
4.		□□□	□□□	□	□	□□□..□□□
5.		□□□	□□□	□	□	□□□..□□□
6.		□□□	□□□	□	□	□□□..□□□

Codes:

Source: 1=project, 2=government agency, 3=Caisse Populaire de Crédit, 4=CLUSA, 5=WOCU, 6=CARE, 7=another NGO, 8= cooperative, 9=individual, 10=private sector org., 11=bank, 12= merchant, 13=spouse, 14=village group, 97=other, 98=don't know, 99=no response.

Objectives: 1=livestock production, 2=livestock fattening, 3=modern agricultural inputs, 4=local seed, 5=agricultural production, 6=health, 7=nursery, 8=commerce, 9=food, 10=natural resource management, 12=traditional ceremonies, 13=clothes, 14=travel, 15=family needs, 16=hire labor, 17=manure, 18=transportation, 19=agricultural equipment, 20=trade in animal products, 21= food vending, 97=other, 98=don't know, 99=no response.

15. List all of the sources of credit IN KIND available in the village.

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16. Pose the following questions about each source of credit.
 a. Does it provide credit to men, women, or both?
 b. What types de credit in kind are available in the village?

No.	Source (write)	Source, Code	Men=1, women=2, both=3	Type, Code
1.		□□□	□	□□□..□□□
2.		□□□	□	□□□..□□□
3.		□□□	□	□□□..□□□
4.		□□□	□	□□□..□□□
5.		□□□	□	□□□..□□□
6.		□□□	□	□□□..□□□
7.		□□□	□	□□□..□□□
8.		□□□	□	□□□..□□□
9.		□□□	□	□□□..□□□
10		□□□	□	□□□..□□□

Codes:

Source: 1=project, 2=government agency, 3=Caisse Populaire de Crédit, 4=CLUSA, 5=WOCU, 6=CARE, 7=another NGO, 8= cooperative, 9=individual, 10=private sector org., 11=bank, 12= merchant, 13=spouse, 14=village group, 97=other, 98=don't know, 99=no response.

Nature: 1=modern agricultural inputs (fertilizer, improved seed, pesticides), 2=local seed, 3=food, 4=manure, 5= agricultural equipment, 6=transportation, 7=livestock, 8=basic necessities, 9=labor, 10=household goods, 11=commerce, 12=family needs, 13=fuel, 97=other, 98=don't know, 99=no response.

III. TECHNICAL ASSISTANCE

17. What are the various sources of technical assistance presently available for agricultural and livestock production, and for natural resource management?
- a. How many times a month do they visit? 49=permanent presence in the village, 48=on demand.
 - b. During how many months per year?
 - c. For how many years have you had this technical assistance in the village?
 - d. What are the principal objectives of their work in the village?

No.	Source, Code	No. of visits per month	No. of months per year	How many years	Objectives (write)	Objectives, Code
1.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		<input type="text"/>
2.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		<input type="text"/>
3.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		<input type="text"/>
4.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		<input type="text"/>
5.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		<input type="text"/>
6.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		<input type="text"/>
7.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		<input type="text"/>
8.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		<input type="text"/>
9.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		<input type="text"/>
10.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		<input type="text"/>

Codes:

Source: 1=project, 2=government agency, 3=government agents working in a project, 4=private sector, 5=missionaries, 6=NGO, 7=Volunteers, 97=other, 98=don't know, 99=no response.

Objectives: 1=soil restoration, 2=improved agricultural production, 3=improved forage production, 4=natural resource management, 5=animal health, 6=improved animal production, 7=plant protection, 8=water management, 9=pasture management, 10=forest resource management, 11=agro-forestry, 12=cash crop development, 13=irrigation, 14=improved hygiene, 15=multi-purpose, 16=extension, 17=credit, 18=impose fines, 97=specify, 98=don't know, 99=no response.

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18. Have you had any agricultural or NRM projects which worked in the village in the past, but have now ended? 1=Yes, 2=No

19. If yes:
 a. What was the name of the project?
 b. How many years since it ended? 45=this year
 c. What were its objectives?

No.	Project (Write the name of project, or "0" if name is unknown)	How many years	Objectives (write)	Objectives, Code
1.		___		___..___
2.		___		___..___
3.		___		___..___
4.		___		___..___
5.		___		___..___
6.		___		___..___
7.		___		___..___
8.		___		___..___
9.		___		___..___
10.		___		___..___

Codes:

Objectives: 1=soil restoration, 2=improved agricultural production, 3=improved forage production, 4=natural resource management, 5=animal health, 6=improved animal production, 7=plant protection, 8=water management, 9=pasture management, 10=forest resource management, 11=agro-forestry, 12=cash crop development, 13=irrigation, 14=improved hygiene, 15=multi-purpose, 16=extension, 17=credit, 18=impose fines, 97=specify, 98=don't know, 99=no response.

IV. NRM

A. Natural Resource Management Interventions

20. Is there an intervention in the village that proposes to help prepare a village territory management plan or a village natural resource management plan? . . . 1=Yes, 2=No

21. If yes: for how many years?

22. Who intervenes to help prepare this plan? 1=Yes, 2=No

Project

Government agency

Villagers

NGO

Specify: _____

23. Is there a Village Territory Management Committee in the village? . . . 1=Yes, 2=No

24. What has been accomplished to this point? _____

25. Is there an intervention in the village that proposes to prepare a forest resource management plan? 1=Yes, 2=No

26. If yes, for how many years?

27. Who intervenes to help prepare this plan? 1=Yes, 2=No

Project

Government agency

Villagers

NGO

Other, Specify: _____

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28. What has been accomplished to this point? _____

29. What are the principal changes in the availability of bush products here? 1=Yes, 2=No

No change	<input type="checkbox"/>
Decrease	<input type="checkbox"/>
Increase	<input type="checkbox"/>
Less bush land	<input type="checkbox"/>
Rarity of certain species	<input type="checkbox"/>
Other, specify: _____	

30. What are the reasons for these changes? 1=Yes, 2=No

Urban expansion	<input type="checkbox"/>
Undisciplined cutting of trees in the bush	<input type="checkbox"/>
Drought	<input type="checkbox"/>
Population increase	<input type="checkbox"/>
God's will	<input type="checkbox"/>
Extension of agricultural fields	<input type="checkbox"/>
Aging of the bush	<input type="checkbox"/>
Other, specify: _____	

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V. COMMUNITY MANAGEMENT OF NATURAL RESOURCES

A. Forest Resources

31. What forest resources do you have? 1 = Yes, 2 = No

Village natural forest

Inter-village natural forest

Village woodlot

Long-term fallow

Trees in and around fields

Classified forest (protected area)

Village nursery

Other: _____

B. NRM Techniques Used, Trees

32. Do villagers do anything to manage the forest resources which belong to the village? 1 = Yes, 2 = No

33. Please make a list of ALL of the forest resource management techniques which you presently use. _____

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34. Pose the following questions about each technique listed:
 a. From whom did you learn this technique?
 b. What are your reasons for using it?

No.	Technique (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for using	Code, Reasons
1.			<input type="checkbox"/>		<input type="checkbox"/>
2.			<input type="checkbox"/>		<input type="checkbox"/>
3.			<input type="checkbox"/>		<input type="checkbox"/>
4.			<input type="checkbox"/>		<input type="checkbox"/>
5.			<input type="checkbox"/>		<input type="checkbox"/>
6.			<input type="checkbox"/>		<input type="checkbox"/>
7.			<input type="checkbox"/>		<input type="checkbox"/>
8.			<input type="checkbox"/>		<input type="checkbox"/>
9.			<input type="checkbox"/>		<input type="checkbox"/>

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=gov., technical service agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women's group, 13=radio, 97=other, 98=don't know, 99=no response.

Reasons: 1=control erosion, 2=improve soil fertility, 3=control water, 4=improve the quality of fruit trees, 5=growth/maintenance, 6=control cutting, 7=windbreak, 8=increase the number of trees, 9=protection, 10=shade, 11=produce wood, 12=prohibited/fines, 13=for the fruit, 14=delimit field, 15=soil/field recovery, 16=reforestation, 17=trekking route, 18=live hedge, 19=against desertification, 20=prevent bush fires, 21=field clearing, 22=livestock feed, 23=save time, 24=improve water infiltration, 25=traditional pharmacology, 26=reduce wood consumption, 27=generate income, 28=restore the environment, 97=specify, 98=don't know, 99=no response.

C. NRM Techniques Known (but not used), Trees

35. Other than the techniques which you just cited, do you know additional techniques to improve the management of trees, even if you do not use them? 1=Yes, 2=No

36. Pose the following questions about each technique:
 a. From whom did you learn this technique?
 b. What are your reasons for not using it?

No.	Techniques Known (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for not using	Code, Reasons
1.			□□□		□□ □□
2.			□□□		□□ □□
3.			□□□		□□ □□
4.			□□□		□□ □□
5.			□□□		□□ □□
6.			□□□		□□ □□
7.			□□□		□□ □□
8.			□□□		□□ □□
9.			□□□		□□ □□
10.			□□□		□□ □□

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=gov. technical service agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women's group, 13=radio, 97=other, 98=don't know, 99=no response.

Reasons: 1=lack of water, 2=lack labor, 3=lack time, 4=prohibited/fines, 5=lack land, 6=not necessary, 7=men's work, 8=responsibility of head of household, 9=lack cash, 10=lack equipment/material, 11=lack means of transportation, 12=don't understand, 13=lack of technical assistance, 14=lack nursery, 15=attracts birds, 16=theft, 17=animal damage, 18=no fruit orchard, 19=not advantageous, 20=responsibility of (gov.) technical services, 21=no pay/incentive, 97=other, 98=don't know, 99=no response.

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D. Pasture Resources

37. What pasture resources do you have? 1=Yes, 2=No

Village pasture reserve

Inter-village pasture reserve

Village bush

Inter-village bush

Fallow

Fields after harvest

Other: _____

38. Do you entrust animals to herders? 1=Yes, 2=No

If yes:

What are the zones of seasonal transhumance frequented by your livestock?

During the rainy season _____

During the dry season _____

E. NRM Techniques Used, Pasture

39. Do villagers do anything to manage community pasture land? 1=Yes, 2=No

40. Please make us a list of ALL the techniques which you presently use to manage community pasture land.

Do you have:

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41. Pose the following questions about each technique mentioned:
 a. From whom did you learn this technique?
 b. What are your reasons for using it?

No.	Technique (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for using	Code, Reasons
1.			□□□		□□□□□□
2.			□□□		□□□□□□
3.			□□□		□□□□□□
4.			□□□		□□□□□□
5.			□□□		□□□□□□
6.			□□□		□□□□□□
7.			□□□		□□□□□□
8.			□□□		□□□□□□
9.			□□□		□□□□□□
10.			□□□		□□□□□□

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=gov. technical service agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women's group, 13=radio, 97=other, 98=don't know, 99=no response.

Reasons: 1=increase the area of pasture land, 2=restore the environment, 3=manage/improve livestock feed, 4=deposit manure in the field, 5=improve livestock growth, 6=improve pasture, 7=protection, 8=avoid animal damage, 9=sale of forage/hay, 97=other, 98=don't know, 99=no response.

F. NRM Techniques Known (but not used), Pasture

42. Other than the techniques which you just cited, do you know additional techniques to improve the management of pasture, even if you do not use them? . . . 1=Yes, 2=No

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43. Pose the following questions about each technique:
 a. From whom did you learn this technique?
 b. What are your reasons for not using it?

No.	Techniques Known (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for not using	Code, Reasons
1.			___		___..___
2.			___		___..___
3.			___		___..___
4.			___		___..___
5.			___		___..___
6.			___		___..___
7.			___		___..___
8.			___		___..___
9.			___		___..___
10.			___		___..___

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=gov. technical service agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women's group, 13=radio, 97=other, 98=don't know, 99=no response.

Reasons: 1= no livestock, 2=not necessary, 3=lack space/land, 4=lack means of transportation, 5=lack cash, 6=men's work, 7=lack time, 8=lack equipment/material, 9=lack labor, 10=don't understand, 11=lack technical assistance, 12=lack seed, 13=requires lots of water, 14=prohibited/fines, 15=lack of consensus, 16=appropriate species not available, 17=inputs not available, 19=not advantageous, 20=responsibility of (gov.) technical services, 97=other, 98=don't know, 99=no response.

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G. Water Resources

44. What water resources do you have? 1=Yes, 2=No
- Traditional wells
- Cemented wells
- Tube wells
- Permanent pond
- Semi-permanent pond
- Temporary pond
- Dam
- River
- Creek
- Depression
- Public fountain
- Faucets in the house or courtyard
- Other: _____
-
-

H. NRM Techniques Used, Water

45. Do villagers do anything to manage village water resources? 1=Yes, 2=No
46. Please, make a list of ALL the techniques you presently use to manage water.

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47. Pose the following questions about each technique mentioned:
 a. From whom did you learn this technique?
 b. What are your reasons for using it?

No.	Technique (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for using	Code, Reasons
1.			<input type="checkbox"/>		<input type="checkbox"/>
2.			<input type="checkbox"/>		<input type="checkbox"/>
3.			<input type="checkbox"/>		<input type="checkbox"/>
4.			<input type="checkbox"/>		<input type="checkbox"/>
5.			<input type="checkbox"/>		<input type="checkbox"/>
6.			<input type="checkbox"/>		<input type="checkbox"/>
7.			<input type="checkbox"/>		<input type="checkbox"/>
8.			<input type="checkbox"/>		<input type="checkbox"/>
9.			<input type="checkbox"/>		<input type="checkbox"/>
10.			<input type="checkbox"/>		<input type="checkbox"/>

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=gov. technical service agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women's group, 13=radio, 97=other, 98=don't know, 99=no response.

Reasons: 1=control water, 2=increase water capacity, 3=hygiene, 4=control erosion, 5=clear area, 6=water conservation, 7=improve water infiltration, 8=avoid accidents, 9=reparation, 10=protection, 11=evacuate water, 12=water retention, 97=other, 98=don't know, 99=no response.

I. Management Techniques Know (but not used), Water

48. Other than the techniques which you just cited, do you know additional techniques to improve the management of water, even if you do not use them? 1=Yes, 2=No

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49. Pose the following questions about each technique:
 a. From whom did you learn this technique?
 b. What are your reasons for not using it?

No.	Techniques Known (Write)	Code, Techs.	a. Source of Knowledge	b. Reasons for not using	Code, Reasons
1.			___		___..___
2.			___		___..___
3.			___		___..___
4.			___		___..___
5.			___		___..___
6.			___		___..___
7.			___		___..___
8.			___		___..___
9.			___		___..___
10.			___		___..___

Codes:

Source of knowledge: 1=existing project, 2=past project, 3=tradition, 4=villagers, 5=husband, 6=gov. technical service agents, 7=private sector, 8=another village, 9=study visit, 10=missionaries, 11=personal knowledge, 12=women's group, 13=radio, 97=other, 98=don't know, 99=no response.

Reasons: 1=not necessary, 2=lack equipment/materials, 3=men's work, 4=lack time, 5=lack cash, 6=lack means of transportation, 7=lack land/space, 8=don't understand, 9=lack technical assistance, 10=lack seed, 11=lack labor, 12=field is distant, 13=lack water, 97=other, 98=don't know, 99=no response.

ANNEX F
REVIEW OF THE 1995 PRE-TEST SURVEY QUESTIONNAIRE

A. Review of Topics Addressed in the Pre-Test Survey

A1. Percent of heads of households, both men and women, aware of the Rural Code.

It would be useful to define a clearer procedure for how the S.O.3 indicator will measure awareness of the Rural Code. The survey asks people about related issues that are important, but these topics are not necessarily related to the phrase "the Rural Code" in the minds of survey respondents. Radio publicity about the Rural Code has not yet reached one-half of the people surveyed. It would seem that tracking knowledge of tenure-related topics and the Rural Code as a set of laws that affect land tenure are important and should be retained in the survey. As long as the topics are better known than the Rural Code itself, publicity concerning the Code has not fully achieved its purpose.

A2. Percent of heads of households, both men and women, with access to market and climatic reporting services.

Among the heads of households surveyed, 86 percent reported having heard radio broadcast news about the climate and 70 percent reported having heard information about market prices during the rainy season (this second may be lower because it had been some weeks before the survey since such information had been broadcast). The combination of these two factors seems to provide an adequate means to measure the S.O.3 indicator. However, it should be noted that these percentages are already high, especially considering that only 30 percent of household heads own radios. It seems that the radio information services are already successful in reaching rural populations and it is unlikely that there will be any large increase in these percentages.

A3. Percent of household heads, both men and women, reporting access to credit

Most credit, either in cash or in kind, is provided by private individuals and local merchants, rather than collective or program-related sources. It would appear to be useful to track the percentage of respondents receiving credit from non-traditional sources as well as from traditional sources.

A4. Alternative Format for Asking About Use of NRM Techniques

An alternative to the PTS questionnaire format would be to replace the original open questions about techniques with a modified table based on "priority categories of techniques." This would appear particularly promising for use in the village questionnaire, addressing the management of communal natural resources.

A table based on these categories might also provide a more efficient alternative to the original open-question format. Either the categories for priority techniques at the village level or those for individual men's and women's questionnaires could be used with the following column headings to create tables to elicit limited but useful information about NRM techniques used. However, without field testing, it is not possible to determine whether this approach would be

more efficient the original format of the 1995 questionnaire, or whether it would provide improve people's responses. It would address some of the weaknesses discussed in the PTS questionnaire (in Section III of the report), but it may create others.

Alternative Format for Recording Use of NRM Techniques

No.	Priority Technique Category	Village (or Individual) Uses: 1=yes, 0=no	Promoted locally by Project X or Agency: 1=yes, 0=no	Used in Neighboring Villages: 1=yes, 0=no
1.				
2.				

A5. Sources of Knowledge of NRM Techniques

It probably would not be appropriate to make policy decisions based on the survey statistics concerning the sources of knowledge about NRM techniques. The most serious bias probably is against past project and the past efforts of state technical agencies. The response "tradition" apparently meant different things to different respondents, particularly respondents of different ages. For example, younger people often reported that animal traction was a traditional technique since they could not remember a time when it did not exist in the village. Older respondents more often replied that animal traction had been introduced by a project or government technical agents.

B. Review of Specific Questions on the Pre-Test Survey Questionnaire

The numbers of the questions reviewed below correspond to those on the Head of Household survey questionnaire, that is in Annex V.

B1. Question 4: Seasonal Migration (*Exode*)

The question is designed to enquire only about seasonal migration, but unless the enumerator remembers to clearly specify that, it is likely that some responses include longer term migration. Money received by rural families is not only from seasonal *exode*. In fact, if a family receives *mandats* it is often from a family member who has migrated for a longer period and does not return home with the money. The inclusion of both seasonal and longer term migration in the responses is not a problem, but the survey needs to be clear about what it is reporting.

B2. Questions 5 and 6: Principal Economic Activities

Answers appear to vary in ways that might not have been expected. Several respondents in herder villages said that the 1994 rainy season was so productive that they had lived on their agricultural production for the last year. Several others said specifically that the cowpea crop was so good that selling cowpeas and thus agriculture had been their primary economic activity for the 1994-95 agricultural year. It appears that answers to this question may be dependent on rainfall and other factors affecting the agricultural year in question.

It was suggested that distinctly different areas of agriculture would be dominant in the different geographic regions surveyed. It is true that rice is the dominant cash crop in the areas that can be irrigated along the Niger River, but that only is true of villages along the shore. Many households have only a small area that can be irrigated, and actually depend on rainfed crops and livestock production. Villages/households without shoreline fields are completely dependent on rain-fed agriculture and livestock production and are more similar to other upland areas than to villages/households with shoreline land.

B3. Question 12: Radio reports on crops and climate

Radio reports about the crops and climate are broadcast only during the cropping (rainy) season. The PTS originally planned to ask if people had listened during the two weeks preceding the survey, but the interviews were conducted several weeks after the radio news had ended. The season in which the survey is done will influence how the question will be asked.

B4. Questions 46-50: Investments in NRM

The survey team checked the investments in NRM (modern inputs and labor) reported against these same responses in the "NRM techniques used" section of the questionnaire. If an individual reported that he/she had used fertilizer, pesticides, or improved seed but did not mention they had purchased any, the enumerators were instructed to ask the source of the input. Women in particular often responded that someone else purchased the inputs, usually their husbands.

S.O.3 might consider whether the use of labor and animal traction should remain on the list of NRM techniques, or be they should be added to the list of investments in NRM. It might be more appropriate to put the uses/outcomes of manual labor and animal traction on the list of NRM techniques.

B5. Questions 58 and 59: Land reserved only for pasture and individuals' use of communal land for pasture

This is a case of apparently simple questions addressing a complex topics. In the villages surveyed, the use of land claimed by households or individuals as permanent pasture is uncommon. Land that remains permanently in pasture usually is communal land. However, everyone has to do something with their livestock during the cropping season. Many people leave a corner of their land uncultivated and stake their livestock there during the day. The alternative is having someone guard the livestock on communal land or sending them on transhumance.

When livestock are staked out, the land is well manured and generally is returned to cultivation the following year. Many producers report that the primary purpose of this rotation pattern is to fertilize and fallow the land. Others report that the primary purpose is to provide pasture for the animals. The survey respondents and the enumerators had difficulty determining if this type of land use was "fertilize and fallow" or "land as pasture." The responses recorded tended to follow peoples' interpretations of whether fallow or pasture was the more important in their reasoning.

Most livestock are loose or are herded by children across the entire village territory after the harvest. Producers also seemed to have different interpretations of whether or not this

practice constituted using community land for pasture. Some people stated that communal access to post-harvest fields did not make the fields communal pasture land.

Both of these questions need to be defined more clearly or linked to a particular interpretation of common practices to generate consistent responses. A series of five questions might be used to clarify responses:

- Do you have a parcel of land that remains in pasture year after year, where you graze or stake your livestock?
- Does the village have, or have access to, an area that is devoted to pasture year after year? If yes, do you use this area to graze or stake your livestock?
- Do you use post-harvest fields to graze or stake your livestock?
- Do you use grass cut from your own fields to feed your livestock?
- Do you use grass cut from communal bush land to feed your livestock?

B6. Questions 69-71: Cash Credit

In some cases, respondents did not seem to know when a cash loan had to be repaid or what the reimbursement would be. These often were loans from individuals within the family and often money that a women received from her husband. Often it was not clear whether such loans ever would be repaid. Respondents seemed to be convinced that these were loans but it seemed less obvious from an outside perspective. One solution would be to ask people only about cash credit from formal sources.

B7. Questions 72-74: Credit in Kind

There are no checks on people's responses in the PTS questionnaire, in terms of evaluating whether the amount of reimbursement for credit in kind had some reasonable correlation with the credit. Thus it would be useful to change the "nature of the credit in kind" column to identify what was received on credit.