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A Practical Guide for Collecting Farmers Socio-Economic and Agronomic Data

AN AFSIS PROJECT FIELD PROTOCOL

Peter Okoth, Elizabeth Nambiro, Peter Kibe, Samuel Njoroge, Rosemary Macharia, Job Kihara and Jeroen Huising

September 2012

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Introduction

The AfSIS project sets a baseline for monitoring changes and provides options for improved soil management. One of the aims of the project is to document farmers' characteristics and practises and use that to determine their current situation as well as their preparedness to engage in effective soil and crop management for improved productivity of their land and soils. Socio-economic and agronomic surveys integrate knowledge about the farmers conditions, wealth status, access to knowledge as well their livelihood status and access to markets. Agronomic surveys assess the farmers' practices related to crop and soil management and are linked to obtained yields using pre-designed questionnaires and field survey including the use of GPS based field survey and the GIS.

Global positioning systems (GPSs) allow locating specific field locations including the farm location within a few feet or metres of accuracy. As a result, numerous observations and measurements can be taken at a specific position and analyzed with reference to the geographic space. Geographic information systems (GISs) are used to create electronic field maps. From this it is possible to make follow up visits to monitor situational changes based on GPS data that records the farmer location.The expected output is the extraction of actionable areas directed at the farmer, at the policy maker or the extension and other institutional services directed at the farmer. This short document presents the steps to realizing the best output of getting good data that can be used for a diverse range of analysis.

Planning the Survey

Socio-economic Survey

Designing a survey in relation to a particular target, consists of defining the information sought, the acceptable level of accuracy, the nature and unit of observation, the population concerned, the variables and explanatory features associated with the main objective and the context in which it is intended to work.

First before conducting a socio-economic survey, it is important to have an idea of the total population of the farmers living in the target area to enable the person going to collect the data have a fair sample of the total number of farmers to be studied. The sample size determination formula is as follows.

$$SS = \frac{z^2 * (p) * (1-p)}{c^2}$$

Where:

SS= sample size

Z = Z value (in this case 1.96 for 95% confidence level)

p = percentage of selecting respondents expressed as decimal, in this case 0.5 (50%)

c = confidence interval, expressed as decimal, in this case 6.75%.

Basically the sample size is based on the level of accuracy required in the statistical analysis. The total population of the farmers in a locality may be obtained from the regional or national statistical records of the area. A 10% sample size is normally considered optimal for generating adequate results during the analysis. The farmers are randomly selected from a database of the existing farmers in an area held by the Census Office or the Local Populations Office if one exists. Should both be missing, it is advisable that a survey is conducted to map the entire farmer households in the targeted population. Use of local administration could assist fill in this gap. In order to have a spatial coverage of the area of interest, the AfSIS project has developed a spatial method for randomly selecting locations for the sampling based on geographic coordinates. In this method, the number of random latitude and number of random longitude points are obtained for the specific area of interest using an Excel random points generator that are then imported into a GIS mapping software such as ARCMAP or ARCVIEW. Once projected and confirmed to be the actual points, they are then exported into a file supported by a GPS waypoints software with the ...(gdb) file extension format system or into the Google Earth software if the points are to be displayed in Google Earth with the ..(kml) file extension format. Special training is required for this procedure. Free software is available for these operations over the Internet at the following links:

http://www.geomidpoint.com/random/

http://www.dnr.state.mn.us/mis/gis/tools/arcview/extensions/DNRGarmin/DNRGarmin.html

Agronomic survey

Agronomic surveys are carried out to assess the current famers crop management practises compared to what is recommended best practise. Agronomic surveys include measurements made on the farmers field that include time of planting, type of land preparation, type of seeds planted, whether or not mineral or organic fertilizers are used, whether weeding is practised and the level of labour or manpower that is sued in the field management operations. Farmers' production and productivity surveys are conducted in two plots measuring 3m x 3m in the main maize field or other crops.

Before embarking on any agronomic survey the individual conducting the survey should first determine the geographic location of the area where the survey is to be conducted and be sure that the concerned farmers are pre-warned and are prepared to support the survey. At the household level, the key variable (e.g., HH - the household variable) takes on unique values to identify a case. Data on the attributes of the plots of land owned by the household e.g.- size, soil type, slope, fertilizer application and land management are extracted and geo-referenced and entered into a file that links to each plot, identified by three key variables, Household (HH), FARM and the individual maize FIELD plot. The common feature in the data is that the Farm and the field plot are all linked to the household, the base unit of observation on which other levels of data are based. The choice of base unit of observation depends on the analytical interest of the study. Food security research uses often the household as the base level. Before conducting an agronomic or a socio-economic survey, the enumerators concerned must be trained.

Training

Training is conducted in a venue with power supply and where electronic filed can be shared in Power Point Presentation where the survey instruments can elaborated and questions asked. The training normally lasts for three to four days. The first day is used to brief the enumerators on what is expected including the purposes of the survey. It is also made clear that the practical work is to be carried out in the field in and less artificial environment. It is important that those

selected to participate in the data collection and whom the training is conducted have agricultural knowledge. A University Degree or a Diploma in the same fields is a minimum prerequisite. Since the theme for the data collection involves extracting information on the farmer practises, it is important that the Extension Service personnel are included in the enumeration team, first to get a better working relationship on the ground and secondly to get them to acquaint themselves with the farming in the area where they serve. We have found that in many instances, some extension staff for some reasons are not very familiar with their working environment and participating in such an exercise benefits them tremendously.

The primary objective of enumerator training is to relay and empower them with the information and skills required to effectively implement the instrument with minimum personal influence and bias on the information recorded. In addition, researchers must carefully train enumerators and their supervisors, provide them with explicit instructions and sufficient logistical support, obtain the cooperation of respondents, and initiate data verification and analysis early in the study. During the training, there is a session on the use of handheld Global Positioning Systems (GPS) and how to transfer GPS data in to MapSource Garmin software and into a Geographical Information Systems (GIS).

Selecting the Enumerators

Before embarking on socio-economic and agronomic surveys the individual conducting the survey should take care of the following items:

Investing time and attention to thinking carefully about survey issues during the design stage can ensure that questions and variables are structured in a format conducive to accurate data collection and efficient data entry. First it is important for the enumerators to understand the questionnaire before conducting the survey because the data-collection phase is very sensitive and is based on a two-way exchange, which is sometimes based on confidentiality and trust between the enumerator and the respondents. It is necessary to explain the relevance of the

survey to the respondents, its purpose, and if necessary guarantee that the information supplied are treated with confidentiality.

The practical implementation of a survey also depends on the skills and training of the researchers or supervisors, enumerators, their monitoring, as well as the methods used for their supervision. This means errors are minimized through appropriate training. These are essential points on which the success of a survey depends and they require very careful attention.

The selection of effective enumerators to conduct structured survey interviews is an important task for collecting valid and reliable data. What constitutes an effective enumerator changes with the type of instrument used, the data desired and the local environment. Interaction between enumerators and respondents counts as much as an accurately designed questionnaire in obtaining accurate, quality data. This meant preferably using enumerators with rural backgrounds to conduct farm-level surveys. Enumerators with a rural background are likely to better understand the respondents' frame of reference, and can thus understand the context of responses. Enumerators should be trained to check for completeness and accuracy in respondent answers after interviews while the field supervisor checks interviewer errors and response consistencies.

Enumerators with a higher educational level may also be required. Generally those to be involved should be University graduates who have elementary knowledge in computers. The enumerators must be able to communicate with the respondents in the language they understand.

Executing the survey

Pretesting

Only through the actual implementation of a questionnaire in a pretest is a researcher able assesses how the instrument works and how respondents interpret and actually answer questions. Pre-testing the questionnaires should be conducted before the actual survey to determine the number of farm households that could be interviewed in each day by looking at the length of questionnaires interviews, data verifications collected by the enumerators and the travel time between villages and between households. This will guide in preparing the timeframe for the survey.

Interviewing technique

A social- economic survey largely depends on the specific objectives of the survey and the information requirements. For example, one can investigate at the level of the village structure, the household, the undertaking, the lineage, the family, the house, the individual, education etc. The most currently used surveying technique is the interview technique. It is often organized around a questionnaire during an interview between the enumerator and an individual or a group of persons being surveyed.

The questionnaire comprises a number of linked questions relating to the same statistical unit and more often to the same level of observation. The quality of the information collected and the facility of processing it depend largely upon the way the questionnaire is structured. Above all it demands very sound experience on the part of the investigator in order to be effective and to obtain quality information. Interviewing techniques have been explored in an attempt to integrate socioeconomic information with biophysical data. Interviews should not be more than 30 minutes.

Design and Instrumentation

Three instruments are used that include: (i) a Socio-economic Questionnaire and (ii) an Agronomy questionnaire (iii) a harvest data questionnaire. The respondents are randomly selected and the questionnaire administered through face-to-face interviews by an enumerator to each respondent. The instrument ensure that data collected refer to the same farming household each time by recording the name of the Household Head, including his/her geo-location. Following are some objectives for which the questionnaire is designed.

1) To get an indication of the farmer's situation and farming profile.
2) To establish the extent to which farmers have access to various sources and channels of information.
3) To determine how farmers are coping with situations of food deficit in case they face any.

4) To determine whether farmers were willing to pay to receive agricultural information, and the amount they were willing to pay for. Basically this is intended to obtained feedback on farmers' perception and value on knowledge.

5) To establish ways of improving farmers production and productivity.

6) To find out the different types of weeds and diseases those are present in the farmers' fields.

7) To establish the characteristics of the farmers land.

8) To establish the relationship between input use and soil/crop productivity.

9) To develop a spatial database of the farmers interviewed.

10) To collect farmers harvest and correlate it with various factors.

11) To evaluate the farmers access to supporting institutions as well as access to markets and input sources.

The Agronomic Survey instrument is appended in this document as Appendix 1 while the Socio Economic Survey Instrument is appended as Appendix 2.

Geo-referencing

During the training, there is a session on the use of handheld Global Positioning Systems (GPS) and how to transfer GPS data in to the Mapsource Garmin software and into a Geographical Information Systems (GIS). Free, open, and dependable nature of GPS has led to the development of hundreds of applications affecting every aspect of modern life. GPS is a satellite- and ground-based radio navigation and locational system that enables the user to determine very accurate locations on the surface of the Earth. GPS technology has provided an indispensable tool for management of agricultural and natural resources. Although the GPS is a complex and sophisticated technology, user interfaces have evolved to become very accessible to the non-technical user. Simple and inexpensive GPS units are available with accuracies of less than 3 meters.

The Global Positioning System (GPS) consists of a network of 24 continuously orbiting satellites that transmit low power radio signals. Ground-based receivers can use these signals to calculate

a location on the surface of the Earth with a high degree of accuracy and precision. A GPS receiver must be locked on to the signal of at least three satellites to calculate a 2D position (latitude and longitude) and track movement. With four or more satellites in view, the receiver can determine the user's 3D position (latitude, longitude and altitude). Once the user's position has been determined, the GPS unit can calculate other information, such as speed, bearing, track, trip distance, distance to destination, sunrise and sunset time and more. A landmark, point of destination or point along a route on one's way noted and recorded using mapping or navigation coordinates is known as a waypoint.

The type of equipment selected depends on a number of considerations, including the degree of accuracy required by the user, budget considerations, ease of use, and working conditions. Today's GPS receivers are extremely accurate, thanks to their parallel multi-channel design. Garmin's 12 parallel channel receivers are quick to lock onto satellites when first turned on and they maintain strong locks, even in dense foliage or urban settings with tall buildings.

One is able to receive data from the GPS unit or storage card. From that you are able to send map sets, waypoints, routes, and tracks using your GPS unit or storage card, or Using the USB Cable to transfer data to or from your GPS unit into the computer. Each time you transfer maps to a data card; you completely erase all data currently stored on the card and replace it with new data. However, if you store maps on a data card and you can transfer waypoints, routes, or tracks, you will not erase the maps on the card.

One is able to transfer waypoints, routes, and tracks from a data card to your GPS unit's internal memory to prevent them from being deleted from your data card. You cannot save maps from a data card to your GPS unit's internal memory. In case you want to transfer data back to your GPS, save your file as Garmin GPS Database Verson 3 (gdb) file format.

The actual location of each farmer household is geo-referenced near the doorstep and recorded as HH001 for the first farmer visited. The four corners Farmers' plots and fields are then geo-referenced. The coding of the farm is HH001P1-HH001P4 and for the field is HH001F1-

HH00F4 respectively. However some field are irregular or hexagonal shape and may require collecting more GPS points.

The GPS provides accurate positioning of the sample points, so that accurate geo-referenced maps of nutrient levels can be made with geographic information systems (GIS), and related to other data sets such as yield maps including other biophysical, social or economic variables. GPS is used to navigate to each farmer's household (Figure 1).
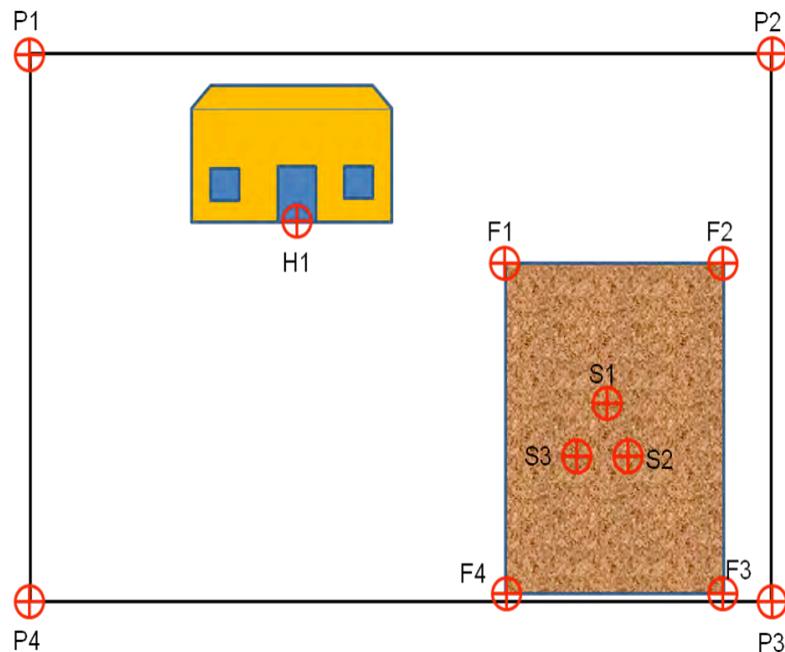

Figure 1: Example of geo-referencing farmers household

Plots Measurements

Two plots of 3m x 3m are randomly selected on the farmers' main maize field or tested crop. The plots are demarcated by pegging with a tape or a rope in which every 3 meters is marked with a stick or a knot to make a 3m x 3m square plot from where measurements are made and recorded.

Soil sampling

During the survey soil samples are collected from the marked 3m x 3m plot separately. From each plot, composite samples of three top soil samples (0-20cm) are collected using a soil auger. The three composite samples are thoroughly mixed to come up with a single sample. The mixed samples are placed in polythene sample bags and labelled according to household codes e.g. HH001S1, HH001S3, etc. The actual location of sampling points is geo-referenced to find back the accurate location on the farmers field (Figure 1). All samples from the agronomic trials are transported to regional laboratories for analysis. In these laboratories samples are processed according to AFSIS standard operating procedures for soil sample processing at regional laboratories. NIR analyses or the standard wet chemistry soil analyses are conducted on all of the samples in the regional labs to determine soil the soil spectroscopic and chemical characteristics.

Harvesting

The selected farmers are informed of the project intent and harvest areas are pre-marked one month prior to harvest. This is to ensure that the farmers do not harvest the marked area before measurements are taken. Sections of the field to be harvested are selected at random. Harvest data on maize farming or other tested crop practices are recorded for each farm in a structured questionnaire for each farmers field surveyed.

Grain and Stover yields in each plot are calculated from a net plot of 3 x 3 metres. First, the number of plants in the net plot are counted and recorded on the harvest form. In order to do this efficiently, one needs to make sure the net plot is marked properly such that plants outside the net plot are not counted. The cobs are then harvested in such a way that the husk still remains on the plant. The cobs are counted and the weight of the total number of cobs is weighed using weighing scale. All the plants in the plot are cut at the soil surface and total Stover fresh weights determined in the field. This can best be done by tying the Stover together with a rope. It is important to weigh the rope and correct it from the measured weight in order to obtain the actual weight of the Stover. Few randomly selected cobs are selected and their

grains separated and weighed to determine moisture content. The maize grain yield is computed from the fresh cop weight as follows: Yield in (kg/ha) = Average cob fresh weight x ((100-average moisture content)/ (100-12)) x Net plot area. This is a method commonly used by the Kenya Agricultural Research Institute (KARI). The AfSIS project uses a slightly different method to determine the stover and grain yield. In this, a net plot of 3 rows x 3 metres is marked out. The number of plants in this net plot is counted and recorded. All the plants in the plot are then cut at the soil surface and the cobs harvested from plants with the husks remaining intact on the maize stems. All the stover is then tied together and the weight recorded in kilograms. A representative sample comprising of five stovers of varying sizes is them weighed and the weight recorded in grams. The five stovers are then cut into small pieces and from this a subsample is obtained and weighed in grams. This subsample is then packed in readiness for drying. After drying the stover sub-sample the weight is recorded and the stover yield determined as follows: Yield in t/ha= ((Total stover fresh weight*(stover subsample fresh weight/stover subsample dry weight))/net plot area *10). To determine grain yield, all the cobs harvested are weighed and the weight recorded in kilograms. From this, a representative sample of 5 cobs of varying sizes is obtained and weighed. From this sample, the grain is separated from the core and the fresh weight of both the core and the grain determined in grams. The grains are then dried and the dry weight obtained. The grain yield is then determined as follows: Yield in t/ha = ((Total cob fresh weight*(grain subsample dry weight/grain subsample fresh weight))/net plot area * 10).

Data entry

To organize the data for efficient entry, processing, and for correct analysis, a researcher needs to recognize the different levels of analysis. The ability of the project to complete data entry within the set time depends on the size and skill of the data processing staff and the amount of time and attention accorded by the researcher to oversee the work. Integrated data entry and analysis software facilitates the ability of researchers to create data files and enter data into a usable and analyzable form. The data must be verified by examining it in order to validate it and remove aberrant data. Data are entered into the CSPro software using pre-designed templates

that are based on the survey instrument (Questionnaire). The data is then exported to an excel worksheet, text file format and GIS environment respectively. The geo-referenced data enables to effectively query the database and retrieve data according to particular selection criteria.

CSPro is an acronym for Census and Survey Processing System, and it has 3 key features namely; Dictionary, Forms and Files. CSPro is a software package that is used for data entry and processing data from censuses and surveys. CSPro templates are designed and used to key in the data as it appears in the questionnaire. This improves the quality of data by eliminating or reducing the chances of errors. Quality data preparation leads to quality data analysis. CSPro data can be exported to other software including: SPSS, STATA or Excel for analysis. The Data preparation process include: 1) Checking quality of field responses, 2) Coding data, 3) Data entry, 4) Checking entered data, 5) Resolving queries, 6) Documenting everything that's been done. The stages of data management include:

- Data collection
- Data entry
- Data consolidation
- Data storage
- Data archiving
- Data Dissemination

The CSPro program is very useful especially in tabulation, data documentation and validation as it captures all details unlike other data entry software.

Analysing the results

The analysis depends on the type of information collected and the desired output. The analysis to be undertaken dictates the levels at which data prepared that constitutes different variables, requiring that the researcher considers up-front the type of analysis that he/she wishes to perform to satisfy the study objectives. This phase must therefore be carefully thought out

when designing the whole survey, making provision for verification by reference both to complementary sources of information and by cross-checking information taken from the data collected.

From the point of view of the analysis as such, statistical methods can be used, but it should not be forgotten that these methods nevertheless need the skills of a practitioner as far as interpretation is concerned. The analyses will typically involve different kind of basic statistical analysis (Descriptive Statistics) in an exploratory phase where general conclusion can be drawn about the data and their suitability for specific analysis. Each objective has its own set of data requirements and for that reason, the data is sliced into subsets for specific analyses. For predictive statistics, regression analyses are used. Regression statistics and correlation statistics are used to measure the weight or extent to which different variables relate to specific dependent variables. For comparative statistics, analysis of variance or comparison of the means and box plots are used. GISs are used to provide a spatial distribution as well as relationships with reference to certain covariates. GISs may also be used to help refine the recommendations that relate to specific farmers' field. Spatial soil data in spatial maps are used to identify variation in soil properties over the landscape ad provides an indication as to what could be happening where and how that relates to the farmers productivity or required amendments. Soil pH, soil organic matter, soil texture and other factors influencing changes in soil responses including crop nutrient access and water content across the field can be estimated. This is important information to guide nutrient application rates, including reasons why certain yield returns are obtained. Typical outputs at this stage are graphs and maps that display the distribution of yield, soil constraints and crop growth variables per sentinel sites.

Data quality

The ability to enter data on a timely basis is an important part of controlling data quality .Data that has been entered in the computer should first be verified and errors corrected. Possible errors should be corrected by checking using the computer software or manually going through

the hardcopy questionnaire. Having the files correctly structured facilitates the task of quality control, as data can be quickly entered and checked both manually and by the computer.

Using Geospatial Technologies in the survey

The uses of GIS and GPS technologies, either individually or in combination, span a broad range of applications and degrees of complexity. Simple applications might involve determining the location of sampling sites, plotting maps for use in the field, or examining the distribution of soil types in relation to yields and productivity. More complex applications take advantage of the analytical capabilities of GIS software. It is therefore necessary to acquire new know-how. It should be noted that GIS and GPS is going to make it possible in the survey to link biological, physical and socio-economic data, and this is going to prove essential. Using appropriate computerized facilities (relational databases and GIS), this tool analyses and synthesizes the information for decision making.

GIS Applications

GIS applications enable the storage, management, and analysis of large quantities of spatially distributed data. These data are associated with their respective geographic features. For example, data on crop yields might be associated with fields or experimental plots, represented on a map by points or polygons (Figure 2). A GIS can manage different data types occupying the same geographic space. The power of a GIS lies in its ability to analyze relationships between features and their associated data. This analytical ability results in the generation of new information, as patterns and spatial relationships are revealed.

Using GIS analytical capabilities, variable parameters that can affect agricultural production can be evaluated. These parameters include yield variability, physical parameters of the field, soil chemical and physical properties, crop variability (e.g., density, height, nutrient stress, water stress, chlorophyll content), anomalous factors (e.g., weed, insect, and disease infestation, wind damage), and variations in management practices (e.g., tillage practices, crop seeding rate, fertilizer and pesticide application, irrigation patterns and frequency).
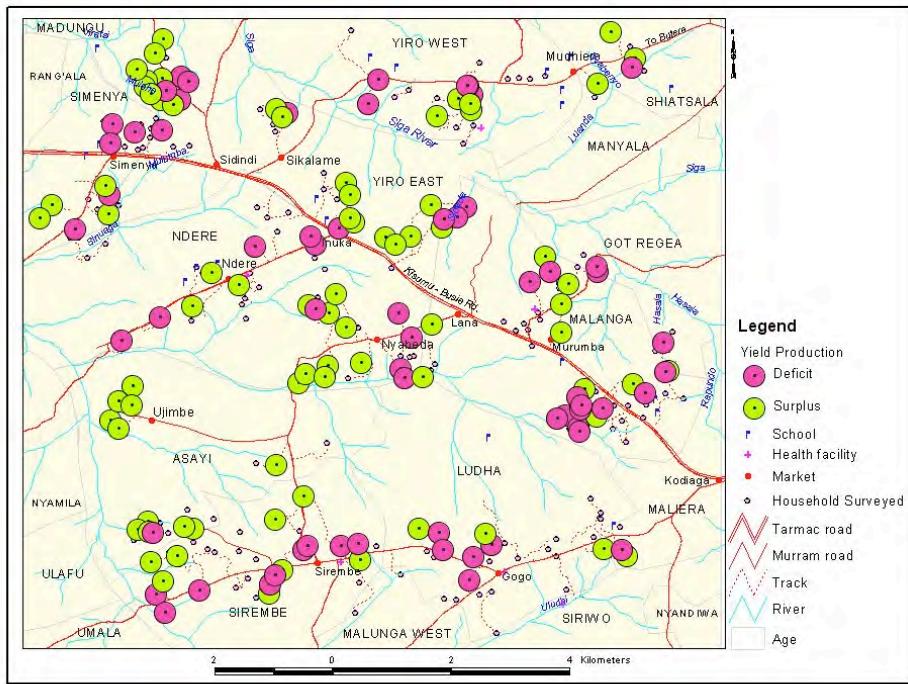
Figure 2: An example of a food security map in individual households based on maize yields in the Sidindi area of Western Kenya

Site-specific data, such as soil characteristics, fertility and nutrient data, topographic and drainage characteristics, yield data, are collected from different sources and stored and managed in a spatial database, either contained within the GIS or connected to the GIS from an external source. The analytical power of a GIS is applied to the data to identify patterns in the field (e.g., areas of greater or lesser yield; correlations between yield and topography or characteristics such as nutrient concentrations or drainage).

Once patterns and correlations are interpreted, management practices can be modified to optimize yield and production costs, and minimize environmental impacts caused by excessive applications of fertilizers and pesticides. Site-specific applications of fertilizers, pesticides and other applications can be implemented by dividing a field into smaller management zones that are more homogeneous in properties of interest than the field as a whole.
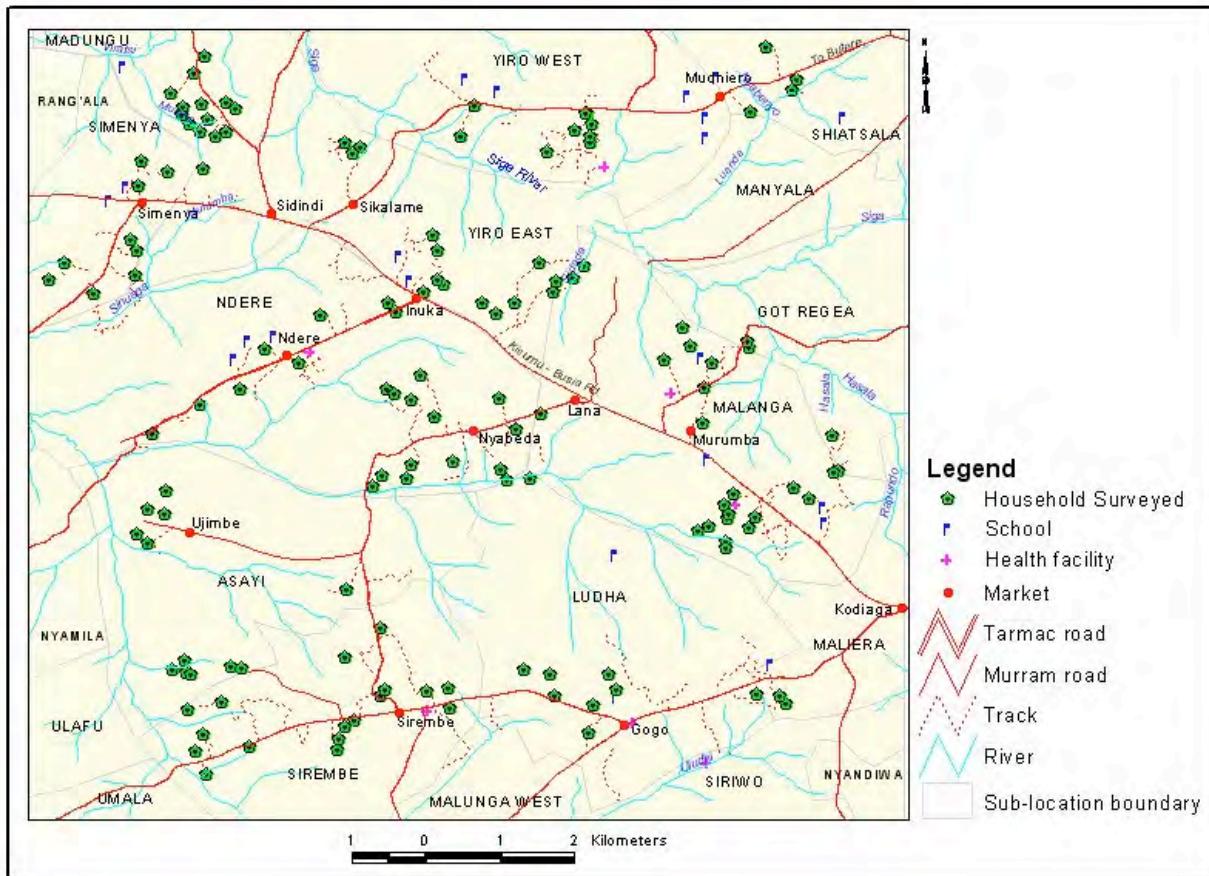
Figure 3: A map showing the farmers sampled and their distribution in the Sidindi area of Western Kenya

GPS Applications

GPS is an essential element of the global information infrastructure. The free, open, and dependable nature of GPS has led to the development of hundreds of applications affecting every aspect of modern life.

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very accessible to the non-technical user. Simple and inexpensive GPS units are available with accuracies of less than 3 meters

GPS equipment for the survey

Recent advances, refinements, and expansion of GPS technology have provided a broad array of choices to users. The type of equipment selected depends on a number of considerations, including the degree of accuracy required by the user, budget considerations, ease of use, and working conditions. Today's GPS receivers are extremely accurate, thanks to their parallel multi-channel design. Garmin's 12 parallel channel receivers are quick to lock onto satellites when first turned on and they maintain strong locks, even in dense foliage or urban settings with tall buildings.

How GPSs work

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Transferring GPS Data

One is able to receive data from the GPS unit or storage card. From that you are able to send map sets, waypoints, routes, and tracks using your GPS unit or storage card, or Using the USB Cable to transfer data to or from your GPS unit into the computer.

Each time you transfer maps to a data card; you completely erase all data currently stored on the card and replace it with new data. However, if you store maps on a data card and you can transfer waypoints, routes, or tracks, you will not erase the maps on the card.

You can transfer waypoints, routes, and tracks from a data card to your GPS unit's internal memory to prevent them from being deleted from your data card. You cannot save maps from a data card to your GPS unit's internal memory. In case you want to transfer data back to your GPS, save your file as Garmin GPS Database Verson 3 (gdb) format.

Procedure:

1. Connect your GPS with your laptop using USB cable
2. Open MapSource
3. From the menu bar select transfer
4. Receive from device
5. When the GPS device is displayed, check what to receive e.g. map, route, waypoint or tracks
6. Press Receive button
7. Save your file as Gdb, Dxf or Txt. In this case save in all formats.

Transferring data from spreadsheet to Arcview GIS

1. Open your .txt file in Microsoft Excel. In the text import wizard, check delimited, press next, check delimiters (tab, comma, space), press, next, press finish)
2. Remove N in Longitude and E in latitude columns and change the title to read Latitude and Longitude respectively.
3. Save your data as Text (Tab delimited)format
4. Open ArcView GIS
5. Select Table and press Add
6. Select List of file type as delimited Text.
7. Search your. txt file and ok

8. Press Views

9. Press view on the menu bar and add event theme

10. Search your table and select X field (Longitude) and Y field (Latitude)

11. Check the box on the left pane

12. Your GPS points are displayed on the View

13. For more analysis convert your GPS points to shapefile by pressing theme on the menu bar.

Expected output

Timely and accurate information is the modern farmer's most valuable resource. This information should include data on crop characteristics, soil properties, fertility requirements, weather predictions, weed and pest populations, plant growth responses, harvest yield, post-harvest processing, and marketing projections. The aim of the surveys is to enable researchers, extension agents and farmers understand constraints which could reduce yields by as much as 70%. It allows a maize producer or other test crop to easily recognize the basic constraints that hinder the optimization of production and productivity.

The outcome of the analyses will typically allow predicting response to added nutrients, and relate with social-economic and agronomic variables for larger areas based on soil and environmental characteristics. Knowledge of specific sources of yield variability can be used to guide the sampling pattern.

A result from the survey is to develop, validate and implement spatial decision support system and to generate maps to enhance maize or test crop productivity. Lastly, it should be borne in mind that surveying operations often make it necessary to ensure feedback of the results so that the conclusions can be presented clearly for decision making process.

Appendix 1: A SURVEY INSTRUMENT FOR ASSESSING YIELDS OBTAINED FROM FARMERS FIELDS

PART 1: MAIZE

Name of farmer_____

Site------------   Date_____

Rationale

One of the aims of the AfSIS project is to estimate the effect of improved management on reducing yield gap between farmer fields and researcher-managed plots. Estimation of yields of the test crop will be undertaken on a section of the field of the same farmer where the diagnostic trial is being conducted. This is the same farmer interviewed in the socio-economic survey.

Farmer production survey will be on two plots measuring 5 m by 5 and located on the main maize field of the farmer conducting diagnostic trials. **The selected portion of a farmers field should be as close as possible to the diagnostic trial (or at least where the same soil conditions are expected).** The selected farmers will be informed of the project intent and harvest areas will be marked out one month prior to harvest. This is to ensure that farmers do not harvest the marked area before measurements are taken. Harvest area will be recorded for each farmer's field surveyed. ***Section to be harvested will be selected at random.***

The following data will also be collected for the crop used as test crop in the area. For Malawi, this is maize:

Crop used by the farmer_____   Name of Variety _____

Spacing between rows (cm)_____Spacing between hills/stations_____(cm)

Number of rows in the 5m plot width_____

Count of total number of hills in 2 randomly selected rows_____

Number of plants in one row for the two selected rows_____

Date of planting on selected field section_____   Seed planted per hill_____

Was thinning done? Yes___No_____   If yes, what was the date of thinning _____

Weeding dates 1)_____2)_____3)_____

Weeding method_____

27

Is the current maize cropped intercropped with another crop? Yes…….. No……..

If yes, which crop?........................

Estimate weeds cover by ticking one of the ratings below

Rating	Percent ground cover by weeds
1	Clean: weed cover below 10%
2	Moderate weed cover (above 10% but less than 30%)
3	High weed cover (above 30% but less than 60%)
4	Very high (weed cover more than 60% of plot surface)

What is the main weed (give name of weed)_____

Is fertilizers applied to this crop (the crop being assessed); Yes_____   No_____

If yes, what fertilizers:

Name of fertilizer	amount applied per acre	date applied
Fertilizer 1:…………………..		
Fertilizer 2:…………………..		
Fertilizer 3:…………………..		

Number of plants lodged due to termite attack _____ Date recorded_____

Are any pesticides/herbicides used on this section during crop cycle? Yes_____   No_____.

Rate disease or pest attack on the provided scales on 3 randomly selected rows (e.g. row 3, 5 and 7). Give the number of plants attacked by stem/stalk borer for different ratings of severity:

Rating	Description	No. of plants
1	No visible larva feeding damage	
2	Small amount of shot-hole-type lesions on a few leaves	
3	Shot-hole injury common on several leaves	
4	Several leaves with shot-hole and elongated lesions	
5	Several leaves with elongated lesions or death of plant	

Number of plants affected by diseases, such as maize streak virus, for the selected 3 rows for each rating class (i.e., proportion of area with lesions according to table below).

Specify disease (1)_____

Rating	Proportion of area with disease lesions	No. of plants
1	0% i.e., No visible signs of disease	
2	1 - 10% of total plant leaf area affected	
3	11 - 25% of total plant leaf area affected	
4	26 - 50% of total plant leaf area affected	
5	>50% of total plant leaf area affected	

Specify disease (2)_____

Rating	Proportion of area with disease lesions	No. of plants
1	0% i.e., No visible signs of disease	
2	1 - 10% of total plant leaf area affected	
3	11 - 25% of total plant leaf area affected	
4	26 - 50% of total plant leaf area affected	
5	>50% of total plant leaf area affected	

Recorded by……………………………………………………

DATA TO BE COLLECTED AT PEAK PLANT MATURITY

At 10 weeks after planting (at about the time of marking our harvest areas), measure plant height and basal diameter for 20 plants. The plants will be selected taking every 5th plant in 3 randomly selected rows

Plant No	1	2	3	4	5	6	7	8	9	10
Height										
Diameter										
PlantNo	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Height										
Diameter										

Observe the general color of the canopy and select a rating from the Table below. i.e., to establish nutrient deficiencies visually. Tick all that apply

Overall crop colour	Tick if condition found
Uniformly very green with most plants being dark green	
Pale or yellowish in upper leaves (starting from leaf tip) while lower leaves remain dark green	
Pale and yellow coloration in a striping or interveinal chlorosis pattern across the whole leaf	
Purple discoloration in several plants, mainly at edges of leaf	
Other (specify) _____	

Recorded by……………………………………………………

DATA TO BE COLLECTED AT HARVEST

Maize Harvest Data

Name of farmer_____   Field Code_____

Sentinel site Details: Name_____   Cluster_____   Date_____

From the 5m and 5m plot selected for the production survey, mark 2 net plots each measuring 3m by 3m and harvest here.

Parameter	Measurement (rep1) 3m x 3m	Measurement (rep2) 3m x 3m
Net plot area (m2)		
Plant count		
Stover FW (minus cobs)		
No. of cobs		
Cob FW		
Grain Moisture content (%)		

Recorded by…………………………………………………

GPS TRACKIING OF HOUSEHOLD AND MAIN MAIZE FIELDS

Homestead position

Latitude……………………..…….. Longitude:………………..….. Altitude:………………………………

FARM

WAY POINT FOR FARM	Latitude	Longitude	Altitude

FIELD

WAY POINT FOR FARM	Latitude	Longitude	Altitude

Recorded by……………………………………………………

Appendix 2: A FARMERS SOCIO-ECONOMIC QUESTIONNAIRE FOR THE AFSIS PROJECT:

EX-ANTE TO IMPACT PATHWAY SURVEY

QUESTIONNAIRE IDENTIFICATION

Questionnaire Serial Number   _____

Country   _____

Division   _____

Locations   _____

Sub-locations   _____

AfSIS site name   _____

Cluster number   _____

Starting time _____   Ending time   _____

Date of interview   _____

Enumerator (Name) _____

Supervised by   _____   Date   ____/____/20_____

MODULE: HOUSEHOLD CHARACTERISTICS

1. Name of household head _____ Cellphone number of respondent: _____

2. Gender of household head [   ] 1= Female, 2= Male

3. Age of household head (Years) _____

4. Level of education of household head (write grade or standard) _____

5. Highest level of education in household _____ [1 = None, 2 = Primary, 3 = Secondary, 4 = Tertiary, 5 = University]

6. Main language spoken in household _____

7. No of household members under the age of 16 years _____

8. No of household members between 16 to 45 years _____

9. No of household members between 46-65 years of age _____

10. No of household members over the age of 65 years _____

11. No of household members with off-farm employment _____

Housing

What is the type of main dwelling place for the household? The enumerator to tick below:

(Note the type of wall, roof and floor (predominant material for the main dwelling)

12(a). What **type of dwelling** does the household live in?	12(b). The **walls are mainly** made of what?	12(c). What is the **roof mainly** made of?	12(d). The **floor is mainly** made of ___?
1. House/Bungalow	1.Stone	1.Corrugated iron sheet	1.Cement
2. Permanent	2.Brick/Block	2.Tiles	2.Tiles
3. .. Semi permanent	3.Mud/Wood	3.Concrete	3.Wood
4. .. Traditional	4.Mud/Cement	4. Grass/ thatch	4.Earth
5. .. Other (specify).........	5.Wood only	5. Other (Specify	5.Other (specify
	6. Mud only		
	6. Other (specify)…………………		

13. Starting with the most important, select 3 main sources of household income [   ], [ ] and [ ] 1= Sale of farm produce ,

2= Sale of livestock, 3 = Small trade, 4= Formal employment, 5 = Casual labour, 6= Remittances from relatives,

7= Pensions,   8 = Dividends, 9= Interest and savings, 10 = House rentals

14. How many household members hold a bank account? _____

15. Source of main drinking water [   ] 1 = Piped, 2 = Spring/River, 3 = Roof catchment, 4=bore

16.   Is distance to drinking water source less than 500 m? [   ] 1 = Yes, 2 = No

17.   Source of cooking energy [   ] 1= Electric power, 2 = Charcoal, 3 = Kerosene, 4 = Firewood, 5 = Canned gas, 6 = Bio-gas

18. Source of lighting energy [   ] 1 = Electric power, 2 = Generator, 3 = Kerosene, 4= solar, 5= others specify _____

19. Name of the nearest market _____

20. Distance to nearest market (km) _____ Time taken to nearest market (hours) _____

Agricultural information

21. In the past one year has the household had access to agricultural information? [ ] 1 = Yes, 2 = No

22. If **Yes**, who provides agricultural information? Tick 3 most applicable: [   ] 1 =Government Extension officer, 2 = Research, 3 = NGO, 4 = Farmer Association, 5 = Relative, 6 = Radio, 7 = Church/Mosque, 8=others _____

23. Which of the following agricultural knowledge/information reference media do you use? Fill in the table appropriately

Information media	Does any of your household member own or access the items 1=Yes, 2=No	How frequently do you or a member of your household use these items 1 = once a day 2 = Once a week 3 = Once a month 4 Others (specify)_	Where do you usually access this item 1 = At home 2 = Friend/neighbour 3 =Communal provider 4 = School 5 = Others 6 = I don't know	Will you pay to receive the reference material? (Yes/No)	How much are you willing to pay (KES) for the reference material?
Internet					
Mobile/sms service					
Print media (Newspaper, magazines etc)					
Planting & agronomy manuals					
Brochures					
Soil maps & atlases					
Crop Doctor					
Others specify _____					

24	Which information 3 source would you prefer to receive information from	(*Rank the 3 most important sources using the scores 1 Not preferred, 2 = somehow preferred, 3 = Most preferred*)
	1. Government extension staff	
	2. Private extension staff	
	3. NGOs	
	4. Field day	
	5. Other farmers	
	6. Mass media (Radio/TV)	
	7. Print media	
	8. Family and friends	
	9. Agrovet shops	
	10. Neighbours	
	11. Internet	
	12. Cellphones	

Household Assets

25. Please indicate the number of assets owned by the household (Write 0 if asset is not owned by the household)

Asset	Total number owned by the household
Cell phones	
Radio	
Television	
Motor vehicles	
Motor cycle	
Bicycles	
Wheel barrows	
Hoes	
Ox-ploughs	
Machetes/cutlasses	
Axes	
Spades	
Sprayers	

Livestock Assets

26. Please indicate in the table below the type and number of livestock owned by the household

Livestock type	Total number owned by the household		
	Indigenous	Pure breed	Crosses
Mature cows			
Mature bulls			
Heifers			
Calves			
Sheep			
Goats			
Pigs			
Rabbits			
Chicken			
Donkeys			
Ducks and turkeys			

Household food security

27. Does the family experience food deficit? Yes/No

28. In the last 30 days how many days did you lack food? _____

29. If yes, please indicate the number of months with food deficits in the household for the year 2009 _____ 2010 _____ and 2011 _____

30. Which are the months of food deficit in the household? Tick where applicable: 1 = January, 2 = February, 3 = March, 4 = April, 5 = May, 6 = June, 7 = July, 8 = August, 9 = September, 10 = October, 11=November, 12 = December

31. How does the household cope with food deficits? Tick as appropriate: 1 = Food purchase, 2 = Donor food aid, 3 = Selling Assets, 4 = Food for work, 5 = Relative food aid, 6= skip one meal, 7=others specify _____

Farm Characteristics

32. Area of Farm (Acres) as per farmers' knowledge _____ Area of farm under cropping? _____

33. Type of land tenure [ ] 1= Freehold title, 2 = Rented, 3 = Leased, 4 = Community access rights, 5=others specify _____

34. Do you own any additional parcels of land? 1=yes, 2=No

35. If yes please provide the following information about the additional parcels

Parcel	Size (Acres)	Type of tenure (1= Freehold title, 2 = Rented, 3 = Leased, 4 = Community access rights, 5= others specify _____)
I.		
II.		
III.		

Main maize field

36.	Please recall your maize cropping activity in the last 3 seasons and provide the information in the table below: (MAIN PARCEL 1[1])	Long rains	Short rains	Long rains
	Agronomic activities done during this period	2011	2010	2010
	What size of land (acres) under **pure stand maize** crop over the following seasons			
	What size of land (acres) was under **maize intercrop** over the following seasons			
	Please specify the intercrop) (e.g maize beans, maize potatoes, maize groundnuts, maize soya beans etc)			
	In the following sections, enumerators fill the information as pertains the total area under maize crop in parcel 1.			
	Land preparation for parcel 1			
	Indicate the total land size (parcel 1) under maize in acres			
	What type of land preparation did you use? (1=animals, 2 = tractors, 3 = manual labour[2])			
	If using animals please indicate if [1 = Own, 2 = Hired]			
	Number of days for land preparation using animal on that piece of land			
	Total cost of preparing that piece of land using animal *(local currency)*			

---

[1] Parcel 1 should be the main maize field. Enumerators should inform the farmer to treat parcel 1 as the main maize field.
[2] During data analysis labor will be rated at each agronomic practice on a scale of 0-100% with 0 meaning lack of labor and 100% optimum labor.

36.	Please recall your maize cropping activity in the last 3 seasons and provide the information in the table below: (MAIN PARCEL 1[1])	Long rains	Short rains	Long rains
	Agronomic activities done during this period	2011	2010	2010
	If using tractor, please indicate if [1 = Own, 2 = Hired]			
	Number of days the tractor was used in that piece of land			
	Total cost of land preparation using tractor on that piece of land *(local currency)*			
	If manual labour, please indicate the type of labour used (1 = Family, 2 = Hired permanent, 3 = Casual labour, 4=all above, 5=others specify _____,)			
	If adult males, how many?			
	If adult females, how many?			
	If children below 18 years, how many?			
	Average payment per person/day *(local currency)*			
	Number of days for land preparation using manual labor on that piece of land			
	Total cost of land preparation using manual labor			
	Maize planting in parcel 1			
	Type of maize seeds used (1 = Local, 2 = Improved, 3=both)			
	If improved specify the maize variety			
	Seed sources (1 = Own seeds, 2 = Purchased (Specify where purchased_____)			
	Quantity of maize seed planted (kg)			
	Price of seed *(local currency)*			
	How much are you willing to pay for the improved maize seed? Give approximate ksh per kg			
		Long rains	Short rains	Short rains
		2011	2010	2010
	Type of planting labour used (1 = Family, 2 = Hired permanent, 3 = Casual labour, 4=all above, 5=others specify _____)			

		Long rains	Short rains	Long rains
36.	Please recall your maize cropping activity in the last 3 seasons and provide the information in the table below: (MAIN PARCEL 1[1])			
	Agronomic activities done during this period	2011	2010	2010
	If adult males, how many?			
	If adult females, how many?			
	If children below 18 years, how many?			
	Average payment per person/day *(local currency)*			
	Number of days spent on planting the beans			
	Amount of seeds used for the specified legume (intercrop) _____			
	Cost of seeds for the legume			
	Weeding parcel 1			
	Please indicate the number of times the maize crop is weeded			
	1st Weeding on parcel 1			
	Type of labour (1 = Family, 2 = Hired permanent, 3 = Casual labour, 4=all above, 5=others specify _____,)			
	If adult males, how many?			
	If adult females, how many?			
	If children below 18 years, how many?			
	Average payment per person/day *(local currency)*			
	Number of days taken to weed the plot			
	2nd Weeding on parcel 1			
	Type of labour (1 = Family, 2 = Hired permanent 3 = Casual labour, 4=all above, 5=others specify _____,)			
	If adult males, how many?			
	If adult females, how many?			
	If children below 18 years, how many?			

36.	Please recall your maize cropping activity in the last 3 seasons and provide the information in the table below: (MAIN PARCEL 1[1])	Long rains	Short rains	Long rains
	Agronomic activities done during this period	2011	2010	2010
	Average payment per person/day *(local currency)*			
	Number of days taken to weed the plot			
	The enumerator will rate the weeds manifestation in the maize field (0%-100%) i.e. 0 if not weeded and 100% if very clean field for the current season as per the observed status			
	Fertilizer applications on parcel 1			
	Planting fertilizer			
	Type of planting fertilizer (1 = None, 2 = DAP, 3 = NPK, 4 = Others (specify _____)			
	Fertilizer sources (Specify where purchased _____)			
	Quantity of fertilizer used (Kg)			
	cost of fertilizer *(local currency)*			
	How much are you willing to pay for fertilizer (10kg pack) in KES			
	Manure application on parcel 1			
	Do you apply manure at planting time? Yes/No			
	Quantity of manure applied per area under maize crop (Wheelbarrows)			
	Sources of manure (1 = From the farm, 2 = Purchased)			
	Price of manure			
	Labour cost for manure application *(local currency)*			
	Top dressing fertilizer if used			
	Type of top-dressing fertilizer (1 = None, 2 = CAN, 3=UREA, 4 = Others Specify___)			
	Quantity used per area under maize crop(Kg)			
	Price per unit *(local currency)*			
	Labour cost for topdressing *(local currency)*			
	How much are you willing to pay for fertilizer (10kg pack) in KES			

36.	Please recall your maize cropping activity in the last 3 seasons and provide the information in the table below: (MAIN PARCEL 1[1])	Long rains	Short rains	Long rains
	Agronomic activities done during this period	2011	2010	2010
	Chemicals used if any			
	Do you use chemicals in maize production? Yes/ No			
	Types (1= Pesticides, 2 = Herbicides, 3= storage chemical, 4 = Others _____			
	Quantity of chemicals used per area under maize crop			
	Amount used in kg/litres			
	Price *(local currency)*			
	Cost of labour for chemical application *(local currency)*			
	Harvesting parcel 1			
	Type of labour for harvesting maize (1 = Family, 2 = Hired permanent, 3 = Casual labour4=all above, 5=others specify _____,)			
	If adult males, how many?			
	If adult females, how many?			
	If children below 18 years, how many?			
	Average payment per person/day *(local currency)*			
	Other harvesting costs if mechanized *(local currency)*			
	Cost of packaging materials if any *(local currency)*			
	Type of labour for harvesting the legume (1 = Family, 2 = Hired permanent, 3 = Casual labour, 4=all above, 5=others specify _____			
	If adult males, how many?			
	If adult females, how many?			
	If children below 18 years, how many?			
	Average payment per person/day *(local currency)*			
	Other harvesting costs if mechanized *(local currency)*			

36.	Please recall your maize cropping activity in the last 3 seasons and provide the information in the table below: (MAIN PARCEL 1[1])	Long rains	Short rains	Long rains
	Agronomic activities done during this period	2011	2010	2010
	Cost of packaging materials if any *(local currency)*			
	Yield/Output in parcel 1 (main maize parcel whose corners are geo-referenced)			
	Quantity of maize produced (kg)			
	Amount of maize consumed (kg)			
	Amount of maize given out (kg)			
	Amount of maize lost through post-harvest losses (kg)			
	Amount of maize sold to the market (kg)			
	Quantity of legume produced (kg)			
	Amount of legume consumed at home (kg)			
	Amount of legume given out (kg)			
	Amount of legume lost through post-harvest losses (kg)			
	Amount of legume sold in the market			
	Type of traders sold to? (1 = At farm gate to rural assemblers, 2 = Local retailers, 3 = Transporters, 4 = Urban retailers, 5 = Others specify_____)			
	Price of maize per kg			
	Price of legume per kg (name of legume_____)			

Code for yield i.e. Units (1 = Tons, 2 = 90kg bags, 3 = 50 kg bags, 4 = Kgs , 5 = Gorogoro)

Assume that labour, fertilizer, and manure are shared by the intercrop: Only costs of seeds and hervesting labour are considered

PESTS, WEEDS AND DISEASES

37. Did you experience diseases in your maize crop in last 12 months?1 = Yes [   ], 2 = No [   ], 3 = I don't know [   ]

38. Did you experience pest problems in your maize crop in last 12 months? 1= Yes [   ], 2 = No [   ], 3 = I don't know [   ]

39. Did you experience nutrient deficiency problems in your maize crop at any given season? 1 = Yes [   ], 2 = No [   ],

   3 = I don't know [   ]

40. Using the main parcel of land with staple crop the farmer will answer the questions below:

Disease/pests/ deficiency	During which periods does the attacks occur 1 = Germination 2 = Growth period 3 = Harvesting	Severity of attack 1 = Not severe 2 = Somehow severe 3 = Very severe	Parts affected 1 = Leaves 2 = Stems 3 = Roots 4 = Cobs 5 = Others	Ability to identify the disease/pest/ deficiency by looking at symptoms 1 = Not at all 2 = Somehow able 3 = Completely able	What percent (%) of your maize crop is affected by this disease/pest/ deficiency	Please indicate the treatment used (e. g chemicals, fertilizers, herbicides, etc)	What is the average cost of treatment (local currency)
Biotic pathogens (i.e. fungi, bacteria, viruses & nematodes) diseases							
1. Common rust							
2. Grey leaf spot							
3. Northern corn leaf blight							
4. Eyespot							
5. Bacterial leaf streak							
6. Maize streak virus							
7. Fusarium ear & stem rot							
8. Cob and tassel smut							
9. Maize Dwarf Mosaic Virus (MDMV)							
Crop (abiotic) diseases, deficiencies & toxicities:							
1. Nitrogen deficiency							
2. Phosphorous deficiency							
3. Potassium deficiency							
4. Moisture stress & wilting							
5. Stunted growth							
Pests							

Disease/pests/ deficiency	During which periods does the attacks occur 1 = Germination 2 = Growth period 3 = Harvesting	Severity of attack 1 = Not severe 2 = Somehow severe 3 = Very severe	Parts affected 1 = Leaves 2 = Stems 3 = Roots 4 = Cobs 5 = Others	Ability to identify the disease/pest/ deficiency by looking at symptoms 1 = Not at all 2 = Somehow able 3 = Completely able	What percent (%) of your maize crop is affected by this disease/pest/ deficiency	Please indicate the treatment used (e. g chemicals, fertilizers, herbicides, etc)	What is the average cost of treatment (local currency)
1. Maize Leaf Weevil							
2. Stemborers							
3. Corn earworm							
4. Common armyworm							
5. Corn leaf aphid							
6. Rodents/monkeys)							
7. Termites							
8. Larger grain borer							
Weeds							
1. Striga, (witches weed)							
2. Grass weeds (e.g. couch grass- *Elytrigia repens*)							
3. Broad leaf weeds							
4. Woody weeds							
5. Others /specify:_____							

41. Farmers perception of Soil

42.	In your own perception what are the 3 indicators of good quality soils e. g amaranth?	
43.	Which of these indicators have you seen on your farm?	
44.	How would you classify the soils in your farm in terms of quality currently	1 =Very good soils 2= Good quality soils 3=Satisfactory 4 = Poor quality soils 5 = I don't know
45.	Do you experience soil erosion problems in your farm?	1 = Yes [ ] 2 = No [ ]
46.	If Yes, what extent of erosion do you experience?	1 = Very severe [ ], 2 = Severe [ ], 3 = Mild [ ], 4 = None [ ] 5 = Can't tell [ ]

47.	During the past 12 months, select (check) techniques used for soil and water conservations in your farm
	1. Grass strips/ un ploughed strip?
	2. Ridges?
	3. Fanya juu/chini (type of terrace)?
	4. Bench terraces?
	5. Drainage/trenches
	6. Water catchment (bunds, ponds)?
	7. Others specify _____

48.   Social capital and community networks

	Do you or any member of your household belong to any community organization/association?	1= Yes [ ] 2 = No [ ]
	If **Yes** tick which ones	1 = Co-operative society [ ] 2 = Microfinance [ ] 3 = Women Group [ ] 4 = Producer Group [ ] 5 = Farmers Association [ ] 6 = Community/Village Group [ ] 7 = Community Marketing Group [ ] 8 = Others (specify) _____
	What services do you get from the organization	1 = Loans [ ], 2 = Labour [ ], 3 = Credit [ ], 4 = Others (specify) _____

RISK
In the last five years, have you experienced any of the following in the household? Tick where appropriate

49. Coping strategies

	Event ID						
50	**Type shock** **See codes for 49.**						
51	**Month and year when happened**						
52	**Action taken(See codes for 50.**						
53	If received assistance from family/ friends, what kind of assistance?1= Cash, 2= In kind, 3= Work in house or on farm, 4= Other specify _____						
54	Has socio-economic position prior to shock been regained? 1= Yes, 2= No						

Codes 49

0= No (none of the following),
1= Human injury or illness necessitating continuous medical treatment,
2= Death of a household member,
3= Death of a family member not resident in the household,
4= Complete or near-complete crop loss due to drought (at least 50% loss),
5= Complete or near-complete crop loss due to causes other than drought – e.g. flood, hail, locust, disease, etc. (over 50% loss),
6= Complete or near-complete herd loss - specify the cause: theft, wildlife predators, drought, disease, etc. (0ver 50% loss),
7= Loss of permanent employment by a household member,
8= Major cut in household income due to falling price of crop or livestock (identify relevant commodity),

Codes for 50:

1= Nothing, 2=Prayed, 3=Sold off livestock, 4=Sold next harvest in advance at below market price, 5=Sold household food supply, 6=Sold land, 7=Sold household assets, 8=Cut household expenses, 9=Took on an extra job, 10=Used savings, 11=Borrowed money using land or crop as collateral, 12=Borrowed money without any collateral, 13=Received assistance from friends or family, 14=Received food aid, 15=Other (specify)

55. Have you ever in the past five years received any windfall (benefits) in the form of: *[1= Children's scholarships 2= Brideswealth payments, 3= Won lottery/sweepstakes, 4= Inheritance, 5= NGO beneficiary, 6= Secured permanent salaried employment 7=others specify_____?]*

56. Amount of windfall (KES) _____

57. What did you do with this windfall? *[1= Pay school fees, 2= Invest in non-farm business, 3= Buy farm inputs, 4= Buy more land, 5= Buy (more) cattle, 6= Spend on household food/clothing needs, 7= Pay dowry, 8= others specify _____]*

QUESTIONNAIRE D'ENQUÊTE SOCIO-ECONOMIQUE : PROJET AFSIS

Numéro du questionnaire _____

Pays _____
Région _____
Nom du site AFSIS _____
Village…………………………………………
Date de l'enquête _____
Enquêteur (Nom) _____
Supervisé par _____

CARACTÉRISTIQUES DES MÉNAGES

1. Nom du chef de ménage _____   Téléphone portable du répondant: _____
2. Sexe du chef de ménage [   ] = 1 femme, 2 = Homme
3. Âge du chef de ménage (An) _____
4. Niveau d'instruction du chef de ménage (écriture catégorie ou une norme) _____
5. Plus haut niveau de scolarité dans le ménage _____ 1 = Aucune, 2 = Primaire, 3 = secondaire, 4 = supérieur, 5 = autres
6. Langue principale parlée au foyer _____
7. Nombre des membres du ménage âgés de moins de 16 ans _____
8. Nombre des membres du ménage entre 16 à 45 ans _____
9. Nombre des membres du ménage entre 46-65 ans _____

10. Nombre des membres du ménage âgés de plus de 65 années _____
11. Nombre des membres du ménage avec un emploi hors exploitation _____

12. Logement

3) 12 (a). Dans Quel type de logement vit le ménage?	4) 12 (b). le toit est principalement constitué de?	5) 12 (c). Le sol est principalement constitué de ___ ?
6) 1. Maison en banco	7) 1. tôles ondulées	8) 1. Ciment
9) 2. Maison en dur	10) 2. Banco	11) 2. carreaux
12) 3. Semi-dur	13) 3. béton	14) 3. bois
15) 4. Maison en paille	16) 4. paille	17) 4. banco
18) 5. Autre (précisez)........	19) 5. Autre (préciser)	20) 5. Autres (préciser)
21)	22)	23)
24)	25)	26)

13. En commençant par le plus important, sélectionnez trois principales sources de revenu du ménage [   ], [   ] et [   ] = 1 vente de produits agricoles, 2 = Vente de bétail, 3 = petit commerce, 4 = emploi salarié, 5 = travail occasionnel, 6 = Aide extérieur, 7 = Pensions, 8 = Dividendes, 9= intérêts de l'épargne, 10 = Maison en location
14. Combien de membres du ménage ont un compte bancaire? _____
15. Principale source d'eau [   ] = 1 pompes, 2 = cours d'eau, 3= puits, 4= autre
16. Distance à la source d'eau potable à moins de 500 m? [   ] 1 = oui, 2 = Non
17. Source d'énergie de cuisson [   ] 1 = Charbon, 2 = Bois, 3 = gaz butane, 4= autres

18. Source d'éclairage 1 = solaire, 2 = Lampe à pétrole, 3= Torche, 4 = Batterie, 5 = bougie,   6= autres à précisez _____
19. Nom de marché le plus proche _____
20. Distance au marché le plus proche (km) _____ Temps prises pour le marché le plus proche (en heures) _____

Information agricole

20. L'an passé est-ce que la maison a eu accès à l'information agricole? [   ] 1 = oui, 2 = Non

21. Si oui, qui fournit de l'information agricole? Cochez les 3 premiers: [   ] = 1 agent de vulgarisation du gouvernement, 2 = Recherche, 3 = ONG, 4 = paysan   5 = parent, 6 = Radio, 7 = Eglise / Mosquée, 8 = autres (à préciser) _____

22. Lequel des médias suivants diffusent l'information agricole ? Complétez le tableau de façon appropriée

27) Information des médias	28) ya t-il un membre de votre ménage qui a accès à ces éléments ? 29) 1 = oui, 30) 2 = Non	31) À quelle fréquence vous ou un membre de votre ménage utilise ces éléments 1 = une fois par jour 2 = Une fois par semaine 3 = Une fois par mois 4 Autres (précisez) _____	32) Où accédez-vous à cet article ? 1 = À la maison 2 = chez un ami / voisin 3 = auprès d'un fournisseur 4 = A l'école 5 = Autres 6 = Je ne sais pas	33) Seriez vous prêt à payez pour recevoir les documents de référence? (Oui / Non)	34) Si oui combien êtes-vous prêts à payer pour le document de référence?
35) Internet	36)	37)	38)	39)	40)
41) Mobile / SMS	42)	43)	44)	45)	46)
47) Les médias imprimés (journaux, magazines, etc.)	48)	49)	50)	51)	52)
53) Manuels d'agronomie	54)	55)	56)	57)	58)
59) Brochures	60)	61)	62)	63)	64)
65) Les cartes des sols et des atlas	66)	67)	68)	69)	70)
71) Agent agricole	72)	73)	74)	75)	76)
77) autres (à préciser) _____	78)	79)	80)	81)	82)

83) 23	84) Quelles sont les trois sources d'information que vous préférez?	85) (Rang des 3 sources les plus importantes en utilisant les scores de 1= plus préféré, 2 = préféré, 3= moins préféré)
86)	87) 1. Personnel de vulgarisation du gouvernement	88)
89)	90) 2. Personnel de vulgarisation privé	91)
92)	93) 3. ONG	94)
95)	96) 4. D'autres agriculteurs	97)
98)	99) 5. Les médias de masse (radio / TV)	100)
101)	102) 6. La presse écrite	103)
104)	105) 7. Famille et amis	106)
107)	108) 8. Magasins	109)
110)	111) 9. Voisins	112)
113)	114) 10. Internet	115)
116)	117) 11. Cellulaire/ Téléphone	118)

Les biens du ménage

24. S'il vous plaît indiquer le nombre de biens matériels détenus par le ménage (0 s'il n'y a pas de biens matériels détenus par le ménage)

119) **Matériels/équipements**	120) Nombre total
121) Les téléphones cellulaires	122)
123) Radio	124)
125) Télévision	126)
127) Les véhicules à moteur	128)
129) Moto	130)
131) Vélos	132)
133) Charrette	134)
135) Houes	136)
137) Charrues	138)
139) Machettes	140)
141) Hache	142)
143) Piques	144)
145) Pulvérisateurs	146)
147) Brouette	148)
149) Semoir	150)

151) Multiculteur	152)
153) Autres (à préciser)	154)
155)	156)
157)	158)
159)	160)

Le cheptel

25. S'il vous plaît indiquer dans le tableau ci-dessous le type et le nombre d'animaux possédés par le ménage

161) Animaux	162) Nombre total		
163)	164) Locale	165) Exotique	166) Croisée (métis)
167) Vaches	168)	169)	170)
171) Bœufs	172)	173)	174)
175) Génisses	176)	177)	178)
179) Veaux	180)	181)	182)
183) Moutons	184)	185)	186)
187) Chèvres	188)	189)	190)
191) Cochons	192)	193)	194)

195) Lapins	196)	197)	198)
199) Poulet	200)	201)	202)
203) Ânes	204)	205)	206)
207) Canards	208)	209)	210)
211) Dindes	212)	213)	214)
215) Autres	216)	217)	218)

Sécurité alimentaire des ménages

26. Y a-t-il un déficit alimentaire dans le ménage? Oui / Non

27. Au cours des 30 derniers jours combien de jours avez-vous manqué de nourriture? _____

28. S'il vous plaît indiquer le nombre de mois avec des déficits alimentaires dans le ménage pour l'année 2009 _____ 2010 _____ et 2011 _____

29. Quels sont les mois de déficit alimentaire dans le ménage? Cochez les mois correspondants: 1 = Janvier, 2 = Février, 3 = Mars, 4 = avril, 5 = mai, 6 = Juin, Juillet 7 = 8 = août, 9 = Septembre, 10= Octobre, 11 = Novembre, 12 = Décembre

30. Comment le ménage a fait face aux déficits alimentaires? Cocher la case appropriée: 1 achat Nourriture, 2 = aide alimentaire des donateurs, 3 = vente de biens, 4 = Travailler pour avoir de la nourriture, 5 = aide alimentaire venant des parents, 6 = réduire le nombre de repas, 7 = autres (à préciser) _____

Caractéristiques de l'exploitation

31. Superficie totale de l'exploitation (Ha) _____ Superficie exploitée (Ha) _____

32. Type de propriété foncière [   ] 1 propriétaire,   2 = terres communautaire,   3 = Héritage,   4= Don,   5= autres à préciser _____

33. Possédez-vous des parcelles de terrain supplémentaires? 1 = oui, 2 = Non

34. Si oui s'il vous plaît fournir les informations suivantes sur les parcelles supplémentaires.

219) Parcelles	220) Taille des parcelles (Ha)	221) 1 = Location temporaire, 2= don, 3 =location de longue durée, 4 = droits d'accès communautaire, 5 = autres (à préciser)
222) I.	223)	224)
225) II	226)	227)
228) III.	229)	230)

Parcelle Principale de Sorgho

231) 35.	232) S'il vous plaît rappeler l'activité de votre champ de sorgho de culture dans les 3 dernières saisons et fournir les renseignements dans le tableau ci-dessous: Parcelle principale de sorgho (parcelle 1)	233) Saison des pluies		
234)	**235) Activités agronomiques fait durant cette période**	236) 2011	237) 2010	238) 2009
239)	240) Quelle est la superficie de la parcelle (ha) en culture pure de Sorgho durant les périodes suivantes	241)	242)	243)
244)	245) Quelle est la superficie de la parcelle (ha) sous culture associées avec le sorgho durant les périodes suivantes	246)	247)	248)
249)	250) S'il vous plaît spécifier la culture associée (haricot/sorgho, pommes de terre/sorgho, arachide/sorgho, soja/sorgho, ...)	251)	252)	253)
254)	**255) Préparation du sol**	256)	257)	258)
259)	260) Quel type de préparation du sol avez-vous utilisé? (1= animaux, 2 = tracteurs, 3 = travail manuel)	261)	262)	263)
264)	265) S'il ya l'utilisation des animaux s'il vous plaît indiquer si [1 = animaux du propriétaire, 2 = Engagé]	266)	267)	268)
269)	270) Nombre de jours pour la préparation du sol avec les animaux sur la parcelle de sorgho	271)	272)	273)
274)	275) Le coût total de la préparation de la parcelle en utilisant les animaux (FCFA)	276)	277)	278)

231) 35.	232) S'il vous plaît rappeler l'activité de votre champ de sorgho de culture dans les 3 dernières saisons et fournir les renseignements dans le tableau ci-dessous: Parcelle principale de sorgho (parcelle 1)	233)	Saison des pluies		
234)	**235) Activités agronomiques fait durant cette période**	236) 2011	237) 2010	238) 2009	
279)	280) Si vous utilisez le tracteur, s'il vous plaît indiquer si [1 = tracteur du propriétaire, 2 = Engagé]	281)	282)	283)	
284)	285) Nombre de jours effectué avec le tracteur sur la parcelle de sorgho	286)	287)	288)	
289)	290) Le coût total de la préparation du sol à l'aide du tracteur (FCFA)	291)	292)	293)	
294)	295) Si le travail est manuel, s'il vous plaît indiquer le type de travail utilisé (1= familial, 2 = salarié permanent, 3 = Le travail occasionnel, 4 = 1+2+3, 5 = autres à préciser	296)	297)	298)	
299)	300) Si hommes adultes, combien?	301)	302)	303)	
304)	305) Si femmes adultes, combien?	306)	307)	308)	
309)	310) Si enfants de moins de 18 ans, combien?	311)	312)	313)	
314)	315) Paiement moyen par personne / jour (FCFA)	316)	317)	318)	
319)	320) Nombre de jours pour la préparation des terres en utilisant le travail manuel	321)	322)	323)	
324)	325) Le coût total de la préparation du sol en utilisant le travail manuel	326)	327)	328)	
329)	**330) Semis de Sorgho dans une parcelle**	331)	332)	333)	
334)	335) Type de semences de sorgho utilisé (1 = locale, 2 = Amélioré, 3 =	336)	337)	338)	

231) 35.	232) S'il vous plaît rappeler l'activité de votre champ de sorgho de culture dans les 3 dernières saisons et fournir les renseignements dans le tableau ci-dessous: Parcelle principale de sorgho (parcelle 1)	233) Saison des pluies		
234)	**235) Activités agronomiques fait durant cette période**	236) 2011	237) 2010	238) 2009
	les deux)			
339)	340) Si amélioré, spécifier la variété de sorgho	341)	342)	343)
344)	345) Sources de semences (1 = propres semences, 2 = achetées (Indiquez le lieu _____)	346)	347)	348)
349)	350) Quantité de semences de sorgho utilisée (kg)	351)	352)	353)
354)	355) Prix des semences (FCFA)	356)	357)	358)
359)	360) Combien êtes-vous prêts à payer pour les semences améliorées de sorgho? Donnez approximativement le prix en kg	361)	362)	363)
364)	365) Type de main d'œuvre utilisé pour les semis (1 famille, 2 = salariés permanents, 3 = le travail occasionnel, 4 = tout, 5 = autres à préciser _____)	366)	367)	368)
369)	370) Si hommes adultes, combien?	371)	372)	373)
374)	375) Si femmes adultes, combien?	376)	377)	378)
379)	380) Si enfants de moins de 18 ans, combien?	381)	382)	383)
384)	385) Paiement moyen par personne / jour (FCFA)	386)	387)	388)
389)	390) Nombre de jours consacrés aux semis de la culture associée	391)	392)	393)

231) 35.	232) S'il vous plaît rappeler l'activité de votre champ de sorgho de culture dans les 3 dernières saisons et fournir les renseignements dans le tableau ci-dessous: Parcelle principale de sorgho (parcelle 1)	233) Saison des pluies		
234)	**235) Activités agronomiques fait durant cette période** (légumineuse principale)	236) 2011	237) 2010	238) 2009
394)	395) Montant des semences utilisées pour la légumineuse spécifique (culture intercalaire) _____	396)	397)	398)
399)	**400) Désherbage de la parcelle**	401)	402)	403)
404)	405) S'il vous plaît indiquer le nombre de fois où la culture de sorgho est désherbée	406)	407)	408)
409)	**410) Premier sarclage sur la parcelle de sorgho**	411)	412)	413)
414)	415) Type de main d'œuvre (1 familial, 2 = salariés permanents, 3 = Le travail occasionnel, 4 = tous les trois, 5 = autres (à préciser_____)	416)	417)	418)
419)	420) Si hommes adultes, combien?	421)	422)	423)
424)	425) Si femmes adultes, combien?	426)	427)	428)
429)	430) Si enfants de moins de 18 ans, combien?	431)	432)	433)
434)	435) Paiement moyen par personne / jour (FCFA)	436)	437)	438)
439)	440) Nombre de jours nécessaires pour désherber	441)	442)	443)

231) 35.	232) S'il vous plaît rappeler l'activité de votre champ de sorgho de culture dans les 3 dernières saisons et fournir les renseignements dans le tableau ci-dessous: Parcelle principale de sorgho (parcelle 1)	233) Saison des pluies		
234)	**235)** **Activités agronomiques fait durant cette période**	236) 2011	237) 2010	238) 2009
444)	**445)** **Deuxième sarclage sur la parcelle de sorgho**	446)	447)	448)
449)	450) Type de main d'œuvre (1 familial, 2 = salariés permanents, 3 = le travail occasionnel, 4 = tous les trois, 5 = autres préciser _____ ,)	451)	452)	453)
454)	455) Si hommes adultes, combien?	456)	457)	458)
459)	460) Si femmes adultes, combien?	461)	462)	463)
464)	465) Si enfants de moins de 18 ans, combien?	466)	467)	468)
469)	470) Paiement moyen par personne / jour (monnaie locale)	471)	472)	473)
474)	475) Nombre de jours nécessaires pour désherber	476)	477)	478)
479)	480) *L'agent recenseur taux de la manifestation des mauvaises herbes dans le champ de sorgho (0% -100%) soit 0 si non désherbé et 100% si le terrain très propre pour la saison en cours selon l'état observé*	481)	482)	483)
484)	**485)** **Fertilisation de la parcelle de sorgho**	486)	487)	488)
489)	**490)** **Engrais minéraux**	491)	492)	493)
494)	495) Type d'engrais de plantation (1 = Urée, 2 = DAP, 3= Complexe céréale, 4= Complexe coton, 5= aucun, 6 = Autres (précisez	496)	497)	498)

231) 35.	232) S'il vous plaît rappeler l'activité de votre champ de sorgho de culture dans les 3 dernières saisons et fournir les renseignements dans le tableau ci-dessous: Parcelle principale de sorgho (parcelle 1)	233) Saison des pluies		
234)	**235) Activités agronomiques fait durant cette période**	236) 2011	237) 2010	238) 2009
	_____)			
499)	500) Sources d'engrais (Indiquez le lieu d'achat) Urée/DAP C.céréal ____ C.coton _____ Autre _____	501)	502)	503)
504)	505) Quantité d'engrais utilisée (kg) Urée ___ DAP ____ C. céréa ____ C.coton, autre (préciser) ____	506) Urée ___ 507) DAP ___ 508) C.céréal ___ 509) C.coton ___ 510) Autre _____ 511) Total _____ 512) 513)	515) Urée ___ 516) DAP ___ 517) C.céréal ___ 518) C.coton ___ 519) Autre _____ 520) Total _____	521) Urée ___ 522) DAP ___ 523) C.céréal ___ 524) C.coton ___ 525) Autre _____ 526) Total _____

231) 35.	232) S'il vous plaît rappeler l'activité de votre champ de sorgho de culture dans les 3 dernières saisons et fournir les renseignements dans le tableau ci-dessous: Parcelle principale de sorgho (parcelle 1)	233) Saison des pluies		
234)	**235) Activités agronomiques fait durant cette période**	236) 2011	237) 2010	238) 2009
		514)		
527)	528) coût de l'engrais (FCFA) Urée ___ DAP ____ C. céréa ____ C.coton, autre (préciser) ____	529) Urée ___ 530) DAP ___ 531) C.céréal ___ 532) C.coton ___ 533) Autre ____ 534) Total _____	535) Urée ___ 536) DAP ___ 537) C.céréal ___ 538) C.coton ___ 539) Autre ____ 540) Total _____	541) Urée ___ 542) DAP ___ 543) C.céréal ___ 544) C.coton ___ 545) Autre ____ 546) Total _____
547)	548) Combien êtes-vous prêts à payer pour les engrais (sacs 50 kg) Urée___ DAP ___ C.cer ___ C.cot ___	549)	550)	551)
552)	**553) Épandage de fumier sur la parcelle**	554)	555)	556)
557)	558) Avez-vous appliqué le fumier au moment des semis? Oui / Non	559)	560)	561)

231) 35.	232) S'il vous plaît rappeler l'activité de votre champ de sorgho de culture dans les 3 dernières saisons et fournir les renseignements dans le tableau ci-dessous: Parcelle principale de sorgho (parcelle 1)	233) Saison des pluies		
234)	**235) Activités agronomiques fait durant cette période**	236) 2011	237) 2010	238) 2009
562)	563) Quantité de fumier épandu par superficie de culture de sorgho (charrettes)	564)	565)	566)
567)	568) Sources de fumier (1 = de l'exploitation, 2 = acheté)	569)	570)	571)
572)	573) Prix de fumier	574)	575)	576)
577)	578) Coût du travail pour l'épandage du fumier (FCFA)	579)	580)	581)
582)	**583) Utilisation des engrais**	584)	585)	586)
587)	588) Type d'engrais (1 = Urée, 2 = DAP, 3 = NPK, 4= Complexe céréale, 5= Complexe coton, 6 = aucun, 7 = Autres (précisez _____)	589)	590)	591)
592)	593) Quantité épandue par superficie de culture de sorgho (kg)	594)	595)	596)
597)	598) Prix unitaire par sac (FCFA)	599)	600)	601)
602)	603) Coût du travail pour l'épandage (FCFA)	604)	605)	606)
607)	**608) Les produits chimiques utilisés le cas échéant**	609)	610)	611)
612)	**613)** Utilisez-vous des produits chimiques dans la production de sorgho? Oui / Non	614)	615)	616)
617)	**618)** Types (1 = les pesticides, 2 = les herbicides, 3 =fongicide, 4	619)	620)	621)

231) 35.	232) S'il vous plaît rappeler l'activité de votre champ de sorgho de culture dans les 3 dernières saisons et fournir les renseignements dans le tableau ci-dessous: Parcelle principale de sorgho (parcelle 1)	233) Saison des pluies		
234)	**235) Activités agronomiques fait durant cette période**	236) 2011	237) 2010	238) 2009
	= Autres _____			
622)	**623)** Quantité de produits chimiques utilisés par superficie de culture de sorgho	624)	625)	626)
627)	**628)** Montant utilisé en kg / litres/sachet	629)	630)	631)
632)	**633)** Le coût du travail pour les applications chimiques (FCFA)	634)	635)	636)
637)	**638) La récolte de la parcelle**	639)	640)	641)
642)	643) Type de main d'œuvre (1 famille, 2 = salariés permanents, 3 = Le travail occasionnel, 4 = tout haut, 5 = autres (à préciser _____)	644)	645)	646)
647)	648) Si hommes adultes, combien?	649)	650)	651)
652)	653) Si femmes adultes, combien?	654)	655)	656)
657)	658) Si enfants de moins de 18 ans, combien?	659)	660)	661)
662)	663) Paiement moyen par personne / jour (FCFA)	664)	665)	666)
667)	668) Autres coûts de récolte mécanisée, si (FCFA)	669)	670)	671)
672)	673) Coût des matériaux d'emballage le cas échéant (FCFA)	674)	675)	676)
677)	678) Type de travail pour la récolte des légumineuses (1 familial, 2 =	679)	680)	681)

231) 35.	232) S'il vous plaît rappeler l'activité de votre champ de sorgho de culture dans les 3 dernières saisons et fournir les renseignements dans le tableau ci-dessous: Parcelle principale de sorgho (parcelle 1)	233)	Saison des pluies		
234)	**235) Activités agronomiques fait durant cette période**	236) 2011	237) 2010	238) 2009	
	salariés permanents, 3 = le travail occasionnel, 4 = tous les trois, 5 = autres préciser _____				
682)	683) Si hommes adultes, combien?	684)	685)	686)	
687)	688) Si femmes adultes, combien?	689)	690)	691)	
692)	693) Si enfants de moins de 18 ans, combien?	694)	695)	696)	
697)	698) Paiement moyen par personne / jour (FCFA)	699)	700)	701)	
702)	703) Autres coûts de récolte mécanisée, si (FCFA)	704)	705)	706)	
707)	708) Coût des matériaux d'emballage le cas échéant (FCFA)	709)	710)	711)	
712)	**713) Rendement / sortie dans la parcelle de sorgho dont les coins sont géo référencées)**	714)	715)	716)	
717)	**718)** Quantité de sorgho produite (kg)	719)	720)	721)	
722)	**723)** Quantité de sorgho consommée (kg)	724)	725)	726)	
727)	**728)** Quantité de sorgho distribuée (kg)	729)	730)	731)	
732)	**733)** Quantité de sorgho perdu par pertes post-récolte (en kg)	734)	735)	736)	

231) 35.	232) S'il vous plaît rappeler l'activité de votre champ de sorgho de culture dans les 3 dernières saisons et fournir les renseignements dans le tableau ci-dessous: Parcelle principale de sorgho (parcelle 1)	233) Saison des pluies		
234)	**235) Activités agronomiques fait durant cette période**	236) 2011	237) 2010	238) 2009
737)	**738)** Quantité de sorgho vendu sur le marché (kg)	739)	740)	741)
742)	**743)** Quantité de légumineuses produites (kg)	744)	745)	746)
747)	**748)** Quantité de légumineuses consommées à la maison (kg)	749)	750)	751)
752)	**753)** Quantité de légumineuses distribuées (kg)	754)	755)	756)
757)	758) Quantité de légumineuses perdues par pertes post-récolte (en kg)	759)	760)	761)
762)	763) Quantité de légumineuses vendues sur le marché	764)	765)	766)
767)	768) Type de commerçants acheteurs? (1 = A u niveau de l'exploitation aux assembleurs ruraux, 2 = Les détaillants locaux, 3 = Transporteurs, 4 = détaillants en milieu urbain, 5 = Autres préciser_____)	769)	770)	771)
772)	773) Prix du sorgho par kg	774)	775)	776)
777)	778) Prix de légumineuses par kg (nom du légume_____)	779)	780)	781)

Code des unités à savoir le rendement (1 = Tonnes, 2 = 100 kg de sacs, 3= sacs de 50 kg =, 4 = Kg, 5 = autres)
Supposons que le travail, des engrais et du fumier sont partagées par la culture intercalaire: Seuls les coûts des semences et du travail de récolte sont considérés

RAVAGEURS, adventices et MALADIES

37. Avez-vous observé des maladies sur le sorgho dans les 12 derniers mois? 1 = Oui [   ], 2 = Non [   ], 3 = Je ne sais pas [   ]

38. Avez-vous rencontré des problèmes d'infestation dans la culture de sorgho dans les 12 derniers mois? 1 = Oui [   ], 2 = Non [   ], 3 = Je ne sais pas [   ]

39. Avez-vous rencontré des problèmes de carence en éléments nutritifs dans votre récolte de sorgho à une saison donnée? 1 = Oui [   ], 2 = Non [ ], 3 = Je ne sais pas []

40. Utilisation de la parcelle principale de terrain avec des cultures de base, l'agriculteur de répondre aux questions ci-dessous:

782) Maladie / ravageurs / déficit	783) périodes attaques 784) 1 = Germination 2 = Période de croissance 3 = Récolte	785) Gravité d'attaque 786) 1 = pas grave 2 = ne certaine manière sévère 3 = très sévère	787) Parties attaquées 788) 1 = Feuilles 2 = Tiges 3 = Racines 4 = Coques 5 = Autres	789) Capacité à identifier la maladie / parasite / carence en regardant les symptômes 1 = Pas du tout 2 = Quelque part en mesure 3 = tout à fait capable	790) % de récolte de sorgho affectée par la maladie / parasite / carence	791) S'il vous plaît indiquer le traitement utilisé (e. g pesticides, herbicides, fongicides ...)	792) Quel est le coût moyen du traitement (FCFA)
793) Pathogènes biotiques (champignons, bactéries, virus et nématodes), les	794)	795)	796)	797)	798)	799)	800)

782) Maladie / ravageurs / déficit	783) périodes attaques 784) 1 = Germination 2 = Période de croissance 3 = Récolte	785) Gravité d'attaque 786) 1 = pas grave 2 = ne certaine manière sévère 3 = très sévère	787) Parties attaquées 788) 1 = Feuilles 2 = Tiges 3 = Racines 4 = Coques 5 = Autres	789) Capacité à identifier la maladie / parasite / carence en regardant les symptômes 1 = Pas du tout 2 = Quelque part en mesure 3 = tout à fait capable	790) % de récolte de sorgho affectée par la maladie / parasite / carence	791) S'il vous plaît indiquer le traitement utilisé (e. g pesticides, herbicides, fongicides ...)	792) Quel est le coût moyen du traitement (FCFA)
maladies :							
801) 1. Tache grise	802)	803)	804)	805)	806)	807)	808)
809) 2. Raies bactériennes	810)	811)	812)	813)	814)	815)	816)
817) 3. pourriture de la tige	818)	819)	820)	821)	822)	823)	824)
825) 4. charbon de l'épi	826)	827)	828)	829)	830)	831)	832)
833) Maladies (abiotiques) des cultures, les déficiences et les	834)	835)	836)	837)	838)	839)	840)

782) Maladie / ravageurs / déficit	783) périodes attaques 784) 1 = Germination 2 = Période de croissance 3 = Récolte	785) Gravité d'attaque 786) 1 = pas grave 2 = ne certaine manière sévère 3 = très sévère	787) Parties attaquées 788) 1 = Feuilles 2 = Tiges 3 = Racines 4 = Coques 5 = Autres	789) Capacité à identifier la maladie / parasite / carence en regardant les symptômes 1 = Pas du tout 2 = Quelque part en mesure 3 = tout à fait capable	790) % de récolte de sorgho affectée par la maladie / parasite / carence	791) S'il vous plaît indiquer le traitement utilisé (e. g pesticides, herbicides, fongicides ...)	792) Quel est le coût moyen du traitement (FCFA)
toxicités :							
841) 1. Le stress hydrique et le flétrissement	842)	843)	844)	845)	846)	847)	848)
849) 2. Retard de croissance	850)	851)	852)	853)	854)	855)	856)
857) Parasites	858)	859)	860)	861)	862)	863)	864)
865) 1. Foreurs de tige	866)	867)	868)	869)	870)	871)	872)
873) 2. Épi du sorgho	874)	875)	876)	877)	878)	879)	880)
881) 3. Puceron du	882)	883)	884)	885)	886)	887)	888)

782) Maladie / ravageurs / déficit	783) périodes attaques 784) 1 = Germination 2 = Période de croissance 3 = Récolte	785) Gravité d'attaque 786) 1 = pas grave 2 = ne certaine manière sévère 3 = très sévère	787) Parties attaquées 788) 1 = Feuilles 2 = Tiges 3 = Racines 4 = Coques 5 = Autres	789) Capacité à identifier la maladie / parasite / carence en regardant les symptômes 1 = Pas du tout 2 = Quelque part en mesure 3 = tout à fait capable	790) % de récolte de sorgho affectée par la maladie / parasite / carence	791) S'il vous plaît indiquer le traitement utilisé (e. g pesticides, herbicides, fongicides ...)	792) Quel est le coût moyen du traitement (FCFA)
sorgho							
889) 3. Termites	890)	891)	892)	893)	894)	895)	896)
897) Les mauvaises herbes	898)	899)	900)	901)	902)	903)	904)
905) 1. Striga (mauvaises herbes)	906)	907)	908)	909)	910)	911)	912)
913) 2. Mauvaises herbes à feuilles larges	914)	915)	916)	917)	918)	919)	920)
921) 3. Les mauvaises herbes ligneuses	922)	923)	924)	925)	926)	927)	928)

41. La perception des agriculteurs sur les sols

929)	930) 42. Dans votre propre perception quelles sont les trois indicateurs de bonne qualité du sol.		931)
932)	933) 43. Lequel de ces indicateurs avez-vous vu sur votre exploitation ?		934)
935)	936) 44. Comment classeriez-vous les sols de votre exploitation en termes de qualité actuellement	937) 1 = Très bonne qualité 938) 2 = Bonne qualité des sols 939) 3 = Satisfaisant 4 = Les sols de mauvaise qualité 5 = Je ne sais pas	
940)	941) 45. Avez vous rencontré des problèmes d'érosion du sol dans votre exploitation ?	942) 1 = Oui [ ] 943) 2 = Non [ ]	
944)	945) 46. Si oui, dans quelle mesure de l'érosion vivez-vous?	946) 1 = très sévère [ ], 947) 2 = sévère [ ], 3 = moyen [ ], 4 = Aucun [ ] 5 = Ne sais pas [ ]	

948) 47.	949) Au cours des 12 derniers mois, sélectionnez (cochez) les techniques utilisées pour la conservation des sols et l'eau dans votre exploitation
950)	951) 1. Bandes enherbées ?

952)	953)	2. Billon
954)	955)	3. Drainage / tranchées en bande
956)	957)	4. Captage d'eau (digues, bassins)?
958)	959)	5. Autres à préciser _____

48. Le capital social et les réseaux communautaires

960)	961) vous ou un autre membre de votre ménage appartient- il à une organisation communautaire / association?	962) 1 = Oui [ ] 2 = Non [ ]
963)	964) Si oui spécifier	965) 1 = Coopérative /société [ ] 2 =Micro finance [ ] 3 = Groupe de femmes [ ] 4 =Groupement des producteurs = [ ] 5 = Association paysanne [ ] 6 = Communauté de village / Groupe [ ] 7 = Autres (précisez) _____
966)	967) Quels services obtenez-vous de l'organisation	968) 1 = Prêts [ ], 2 = Travail [ ], 3 = Crédit [ ], 4 = Autres (préciser) _____

RISQUE

Au cours des cinq dernières années, avez-vous vécu l'un des événements suivants dans le ménage? Côchez la case correspondante

49. Les stratégies d'adaptation

969)		970)	Description de l'événement	971)	972)	973)	974)	975)	976)
977)	50	978)	Type de chocs *Voir les codes pour 49.*	979)	980)	981)	982)	983)	984)
985)	51	986)	mois et l'année du choc	987)	988)	989)	990)	991)	992)
993)	52	994)	Mesures prises (Voir codes pour 50).	995)	996)	997)	998)	999)	1000)
1001)	53	1002)	Si l'aide reçue de la famille / amis, quel genre d'aide? 1003) 1= argent en espèce, 2 = En nature, 3 = travail dans la maison ou dans l'exploitation, 4 = Autre	1004)	1005)	1006)	1007)	1008)	1009)
1010)	54	1011)	La position socio-économique après le choc a t-il été établie? 1 = oui, 2 = Non	1012)	1013)	1014)	1015)	1016)	1017)

Codes 49

0 = Non (aucun des suivants),
1 = blessure ou maladie

2 = La mort d'un membre du ménage,
3 = mort d'un membre de la famille qui ne réside pas dans le ménage,
4 = perte totale des cultures ou quasi-complète à cause de la sécheresse (au moins 50% de perte),
5 = perte totale des cultures ou quasi-complète en raison d'autres causes que la sécheresse - par exemple inondations, la grêle, sauterelles, maladie, etc. (plus de 50% de perte),
6 = perte du troupeau complet ou quasi-complète - préciser la cause: le vol, les prédateurs de la faune, la sécheresse, maladies, etc (0ver perte de 50%),
7 = Perte d'emploi permanent par un membre du ménage,

8 = baisse majeure dans le revenu des ménages due à la chute des prix des récoltes ou de bétail (identifier les produits pertinents),

Codes pour 50:

1 = Rien, 2 = prier, 3 = Vente du bétail, 4 = Vendu prochaine récolte à l'avance à prix inférieurs au marché, 5 = vente des approvisionnements alimentaire s du ménages, 6 = terrain vendu, 7 = actifs des ménages Vendu, 8 = Couper les dépenses des ménages,9 = A pris un emploi en plus, 10 = économies d'occasion, 11 = argent emprunté en utilisant la terre ou des cultures en tant que garantie, 12 = emprunté de l'argent sans aucune garantie, 13 = reçu de l'aide auprès d'amis ou en famille, 14 = l'aide reçu de la nourriture, 15 = Autres (à préciser)

55. Avez-vous déjà dans les cinq dernières années reçu une aide/cadeau sous la forme de : [1 = bourses pour enfants   2 =cadeau de mariage, 3 = loterie / tirage au sort,   4 =Héritage, 5 = ONG,   6 = salaire   7 = autres à spécifier _____?]

56. Montant de l'aide ou du cadeau _____

57. Qu'avez-vous fait de cette aide ou cadeau? [1 = payer les frais scolaires,   2 = Investir dans des entreprises non agricoles,   3 = acheter des intrants agricoles,

4 = acheter plus de terres, 5 = Achat des animaux,   6 = consacrer à l'alimentation des ménages / besoins vestimentaires,   7 = payer les nécessaires de mariage,

8 = autres préciser _____

ENQUETE AGRONOMIQUE POUR ESTIMER LE RENDEMENT OBTENU DANS LES CHAMPS PAYSANS

PARTIE 1: SORGHO

Nom du paysan_____

Site : _____   Date :_____

Introduction
Un des objectifs du projet AFSIS est d'estimer l'effet des techniques améliorées de production réduisant les baisses de rendement entre les champs des paysans et les champs expérimentaux des chercheurs en station. Les enquêtes agronomiques sur les rendements des cultures sont faites sur une autre partie des champs des paysans ayant participé à la conduite des essais diagnostics et à l'enquête socioéconomique.

Pour ce faire, l'enquête agronomique sur la production sera menée dans deux carrés de rendement de 5mx5m et situés sur le champ principal de sorgho de l'unité de production agricole UPA du même paysan. La partie choisie doit être la plus proche possible du site de l'essai diagnostic (partageant les mêmes conditions de sols). Le paysan choisi doit être largement édifié et informé de l'objectif de l'étude. Des carrés de rendement doivent être placés dans le champ un mois avant la récolte. Ceci est pour rassurer que la partie marquée ne sera pas récoltées avant que les observations n'y soient faites. La superficie récoltée sera notée pour chaque champ enquêté. ***Les carrés à récolter doivent être choisis au hasard***.

Les données suivantes seront collectées sur la culture utilisée par les paysans de la zone.

Culture du paysan_____   Variété _____

Espacement entre les lignes (cm)_____et entre les poquets _____(cm)

Nombre de lignes dans la parcelle de 5m de large_____

Nombre de poquets sur 2 lignes choisies au hasard _____

Nombre de plants sur une des deux lignes choisies_____

Date de semis du champ_____ Nombre de graines par poquet_____

Démariage a t-il été fait? Oui___ Non_____ Si oui, à quelle date? _____

Dates de désherbage 1)_____2)_____3)_____

Méthode de désherbage_____

Le Sorgho est-il cultivé en association avec d'autre culture? Oui…….. Non……..

Si oui, quelle culture?........................

Estimer de la dynamique des mauvaises herbes en cochant devant les note ci-dessous.

Notation	Pourcentage de couverture du sol	(Rep 1)	(Rep 2)
1	Sol propre: moins de 10% de densité de couverture du sol par les herbes		
2	Densité moyenne des herbes couvrant le sol: plus de 10% mais moins de 30% de couverture		
3	Densité élevée d'herbes (plus de 30% mais moins de 60% de couverture)		
4	Densité très élevée d'herbes (plus de 60% de couverture de la parcelle)		

Quelle est l'herbe dominante (donner le nom) _____

Est ce que cette culture a t- elle reçu de l'engrais ? (la culture en question); Oui_____Non_____

Si oui, quel engrais?

Nom de l'engrais	Quantité/ha (Rep 1)	Quantité/ha (Rep 2)	date d'apport (Rep 1)	date d'apport (Rep 2)
Engrais 1:…………………..				
Engrais 2:…………………..				
Engrais 3:…………………..				

Nombre de plants versés à cause des attaques des termites _____Date de la collecte_____

Y a t-il des pesticides / herbicides utilisés pendant au cours de la croissance de la culture? Oui_____ Non _____.

Notation de la maladie ou de l'attaque de la peste sur 3 lignes choisies au hasard (ex. ligne 3, 5 and 7).
Donner le nombre de plants attaqués par les foreurs de tige suivant différentes notations (échelles) de sévérités:

Notation	Description	Nombre de plants	
		(Rep 1)	(Rep 2)
1	Aucun dégât visible des larves		
2	Petits trous en forme de lésion sur quelques feuilles		
3	Petits trous en forme de lésion fréquentes sur plusieurs feuilles		
4	Plusieurs feuilles présentant des trous et de larges lésions		
5	Plusieurs feuilles avec de larges lésions ou des plants morts		

Nombre de plants affectés par les maladies foliaires du sorgho, sur les 3 lignes noter la sévérité
(Ex : proportion de surface avec les lésions selon le tableau ci- dessous).

Spécifier la maladie (1)_____

Notation	Proportion de surface foliaire avec des lésions	Nombre de plants	
		(Rep 1)	(Rep 2)
1	0% aucun symptôme de la maladie n'est visible		
2	1 - 10% de la surface totale foliaire des plants affectés		
3	11 - 25% de la surface totale foliaire des plants affectés		
4	26 - 50% de la surface totale foliaire des plants affectés		
5	> 50% de la surface totale foliaire des plants affectés		

Spécifier la maladie (2)_____

Notation	Proportion de surface foliaire avec des lésions	Nombre de plants	
		(Rep 1)	(Rep 2)
1	0% aucun symptôme de la maladie n'est visible		
2	1 - 10% de la surface foliaire des plants affectés		
3	11 - 25% de la surface foliaire des plants affectés		
4	26 - 50% de la surface foliaire des plants affectés		
5	> 50% de la surface foliaire des plants affectés		

Collecté par ……………………………………………………

Noter la coloration générale de la canopie foliaire en cochant la notation ci-dessous pour établir la déficience visuelle nutritionnelle.

Coloration générale de la canopie	Cocher si c'est le cas	
	(Rep 1)	(Rep 2)
Uniformément très vert avec la plus part des plants en vert foncé		
Des feuilles supérieures pales ou jaunes sales (commençant par le sommé de la feuille) et les feuilles inférieures demeurent vertes foncées		
Coloration pale et jaune des feuilles présentant de la chlorose intervénale sur la feuille entière		
Des discolorations pourpres généralement sur le bord de la feuille de plusieurs plants,		
Autre à spécifier		

Collecté par ………………………………

Données à collecter à la récolte
Récolte du sorgho

Nom du producteur_____   Code du champ_____

Détails du site : Nom_____   Cluster_____   Date_____

De la parcelle de 5m x 5m choisie pour l'enquête sur la production, sélectionner 2 parcelles utiles mesurant chacune 3m x 3m et récolter le contenu.

Paramètre	Observations (Rep 1) 3m x 3m	Observations (Rep 2) 3m x 3m
Superficie de la parcelle utile (m2)		
Nombre de plants		
Poids paille fraiche (sans les épis)		
Nombre d'épis récoltés		
Poids épis frais		
Humidité dans les grains (%)		

Coordonnées du champ
     Latitude
      Longitude		

Point échantillonné
     Latitude
      Longitude
	S_1	S_2

Collecté par……………………………………………………

GEOREFERENCEMENT DE L'EXPLOITATION ET DU CHAMP DE SORGHO

Position géographique de l'exploitation

Latitude…………………..…….. Longitude:………………..….. Altitude:………………………………

Exploitation

WAY POINT du FARM	Latitude	Longitude	Altitude

Echantillonnage du sol

WAY POINT du Champ	Latitude		Longitude		Altitude	

Collecté par……………………………………………………

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