

Protocol for the Agricultural Biodiversity (ABD) Assessment in Ghana

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Introduction

The biodiversity of plant and animal species both domesticated and wild used for food by humans (referred to here as agricultural biodiversity—ABD) is one of the most important assets for rural households, particularly for the poor in marginal areas such as the drylands of the developing world. A contribution of Bioversity International to the Dryland Systems CGIAR Research Programme (CRP) [<http://drylandsystems.cgiar.org/>] has been to examine systematically the diversity of these species in CRP target sites in Mali, Ghana, Malawi and India. Bioversity and partners have carried out a set of Agricultural Biodiversity Assessments in these countries. In the case of Ghana, the selected sites include three villages in the Wa region: Bompari, Gbelinkaa, Yagtuur. Here we present the protocols used for collecting the data from Ghana.

The objective of the ABD Assessment is to identify and quantify all the useful plant, animal, and aquatic species utilized by rural households and communities in the Dryland Systems CRP sites, as well as information on markets attended and general socioeconomic household characteristics. This information will be used to characterize three dimensions of ABD: (1) diversity in the production system, including on farm and common lands; (2) dietary diversity; and (3) market diversity; in terms of the elements and relationships involved and the exogenous factors that influence their status and dynamics. These data will be the basis for analyzing the roles of ABD in the lives and livelihoods of these rural populations in order to identify entry points for designing and implementing interventions that contribute to improve their well-being.

The ABD Assessment consists of two parts:

- (1) a series of focus group discussions (FGDs) to elicit the local knowledge about the agricultural and wild biodiversity present in the study areas in order to generate: (a) an inventory (list) of all useful plant, and animal species used by local communities for human food, animal feed, medicine, fuel, housing, farming tools, etc. and their local names; (b) an inventory of all foods consumed; (c) an inventory of species and products bought and sold in markets that people in the village attend.¹ All the FGDs

¹ Markets are understood here in the widest sense, as the places where households purchase and sell items, thus this can happen in their own villages or even house with itinerant traders, etc. It is not restricted to village markets or specific locations.

should be held separately for men and women in order to collect gender disaggregated data. Effort should also be made to have different social categories of people in the study areas be represented in the FGDs.

(2) a household survey with a representative random sample of 60 households per village for the three villages that were selected in region of Wa in Ghana for a total sample size of 180 households. Two of the three villages have been already sampled part of an ICRISAT baseline survey. An additional village was selected by Biodiversity to complement the work. In the case of the two villages already studied by ICRISAT, the household survey will take, if possible, with the same households that the ICRISAT baseline (otherwise additional households will be selected randomly to complete the sample size). For the third village a random sample of households will be drawn.

- (a) One that elicits information on the ABD use by the household;
- (b) Another that elicits information on foods consumed by specific members of the household.

The criteria for determined to whom each section should be applied to is presented in the appropriate section.

Focus group discussions will be carried in all the 3 selected villages.

Information will be collected on the useful species grown/collected/managed in the target villages. For common and well-known species, it suffices to obtain the name and a photo of each species recorded in the list of useful plants in the target communities. However, voucher specimens (herbarium) should be collected for species and varieties which are not common, for which common and scientific names are unknown to the surveyors, e.g. wild species. Voucher specimens should be systematically collected for latter identification by specialists. The surveyors will be provided with field camera, GPS, and necessary equipment for plant specimen voucher collection. Information (herbarium, local names and locations where collected) on all the species collected during the FDGs from the three villages will be sent by the national partner to a botanist that will identify the scientific names. For animal species (e.g. livestock), just photos would be sufficient, and a specialist shall confirm identifications (common and scientific names). This requires selecting of the team members that has experience on collecting voucher specimens or alternatively, training one on the appropriate techniques of collecting and managing the specimens.

Once the FGDs for all villages have been completed, the teams will proceed to carry out the household survey.

Protocol for the Focus Group Discussions (FGD)

The FGD will elicit information on (a) biological diversity in the production system – on the farm as well as harvested from forest and community land; (b) dietary diversity – consumed in house and also purchased from market; and (c) diversity of species and products sold and bought in markets (markets understood widely as any place where people buy and sell goods and services, not just village markets, and including their own dwelling if commercial activities take place there). There are a few important principles to keep in mind about the FGD:

- The FGD aims to capture the collective knowledge of the community, not of the specific participants in the group
- There is a need to capture as much diversity as possible, i.e. to identify as many species as possible, particularly for those species used by few people or even rarely. Therefore, it is important to probe for additional species; every species is important no matter how insignificant it may appear to be.
- Capture gender differences is essential part of the FGD process
- There is no right or wrong answer, all answers are valid
- It is important to capture, to the extent possible, the discussions that take place during the FGD.

The FGD will be organized in the following manner:

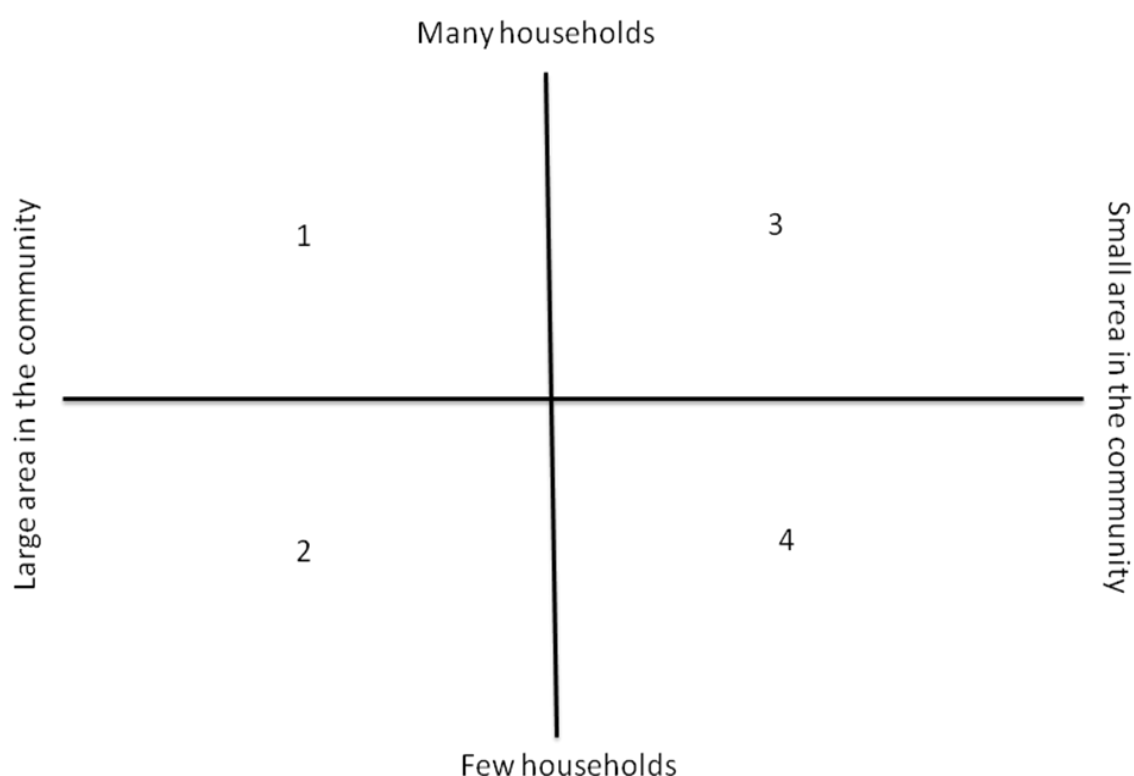
- There will be two groups: one of males and one of females
- Each group will deal with the three aspects for discussion:
 - Useful biological diversity in the production system;
 - Market diversity;
 - Dietary diversity.
- There will be of approximately 10 participants per group (but no more than 16)
- Each group should include a cross-section of individuals involved in agricultural production or at least collecting useful plants from common lands and the wild, representing different levels of access to land (land owners, local land renters and migrant land renters), different ethnic groups present in the village and different age groups (special emphasis should be placed to include younger farmers).
- For each group there will be two facilitators, one to guide the exercise and the other to document the process (take notes, photographs, etc.)
- In the case of male groups, the facilitators should be male and for female groups they should be female

At the beginning of the exercise, the facilitator will explain to the group that as they well know, there are many species of plants and animals that are used by people there. However,

some are grown by many farmers in the community, while others are by just a few and at the same time some of these same species are grown in a large area within the community, while other are usually grown in a small area within the community. The facilitator then draws the four squares in a large piece of paper on the floor (Figure 1). The four squares are:

- (1) many households and large area in the community;
- (2) few households and a large area in the community;
- (3) many households and a small area in the community;
- (4) few households and a small area in the community.

Figure 1.



The facilitator will explain that the axes may change depending on the category of species that will be discussed.

ABD in production systems

The work will be carried in the following sequence:

1. Participants are asked to make a list of all relevant species (e.g. free listing of species).

2. Once the list has been completed, proceed to place each species in the appropriate quadrant according to the indication of the participants. It is important to emphasize that the decision to place a species in a particular quadrant should be a group decision, not just made by one member. If there is controversy discuss until consensus is reached, if no consensus then indicate so in the notes.
3. To identify the lean season/season of scarcity, the facilitator will ask the participants to name the seasons that they recognize and what months each season include. Then they will be asked to describe each season and which one(s) they consider the off/lean season(s) and why.
4. For each species once it has been placed in a quadrant, ask participants the following questions about the species (the answer should be yes or no). One of the facilitators should mark the answers in the appropriate column, as well as any relevant information or observations in the last column:
 - (a) Is the species (parts of it or products derived from it) used as food for own consumption?
 - (b) Is the species (parts of it or products derived from it) sold by community members?
 - (c) Is the species (parts of it or products derived from it) bought by community members?
 - (d) Is the species available during the season of food scarcity?
5. Continue with the next species and repeat the process until all species in the list have been classified.
6. Once all species have been classified, ask what are the general reasons species were placed in a particular quadrant, for each of the four quadrants; the point is not to elicit particular reasons for specific species, but general ones for the set of species placed in each of the cells.

It is very important to draw the group's attention to squares (3) and (4). The facilitator will explain that we are particularly interested in identifying species on those squares because they are usually ignored, but they can be important and particularly have potential in the future.

A table to record the results of the Focus Group Discussion using the four-square method has been produced (see Appendix 1). One table will be filled for each category of species (e.g. annual species, perennial species, animals, etc.). Two additional columns at the end of the form have been added to capture the information of the four quadrant exercise for sold and purchased species. These columns will be filled when the ABD in Markets section is implemented.

The exercise will start with annual and biannual plant species grown on farm, kitchen/home gardens. The facilitator will probe for different categories of species including cereals, roots,

tubers, legumes, vegetables, oil crops, fruits, industrial crops (e.g. cotton). The exercise will be repeated for each of the remaining categories:

1. Annual and biannual crop species
2. Useful tree and shrub species in individual and common lands (perennial). These include both cultivated (e.g. mango) and agro-forestry species. Many of these species are multi-purpose, e.g. providing fruits, leaves, wood, fodder, etc.
3. Useful wild or semi-wild species used for food harvested from farms, forest areas or communal lands (annual or perennial).
4. Domesticated animals
5. Wild animals.
6. Fish and other aquatic resources

In the case of Useful tree and shrub species in individual lands (perennial) including both cultivated and agro-forestry species, the four cells will be modified as follows:

- (1) many households with many trees/shrubs within their individual farms;
- (2) many households with a few trees/shrubs within their individual farms;
- (3) few households with many trees/shrubs within their individual farms;
- (4) few households with few trees/shrubs within their individual farms.

In the case of useful wild or semi-wild species common lands (perennial), the four cells will be modified as follows:

- (1) many households utilize the species and there is high availability in common lands;
- (2) few households utilize the species and there is high availability of the species in common lands;
- (3) many households utilize the species and there is little availability of the species in common lands;
- (4) few households utilize the species and there is little availability of the species in common lands.

In the case of domesticated animals the four cells will be modified as follows:

- (1) many households own many animals;
- (2) few households own many animals;
- (3) many households own few animals;
- (4) few households own few animals.

In the case of wild animals the four cells will be modified as follows:

- (1) many households utilize the species and there is high availability of the species within the community and surrounding areas;
- (2) few households utilize the species and there is high availability of the species within the community and surrounding areas;
- (3) many households utilize the species and there is little availability of the species within the community and surrounding areas;
- (4) few households utilize the species and there is little availability of the species within the community and surrounding areas.

In the case of fish and other aquatic resources the four cells will be modified as follows:

- (1) many households utilize the species and there is high availability of the species within the community and surrounding areas;
- (2) few households utilize the species and there is high availability of the species within the community and surrounding areas;
- (3) many households utilize the species and there is little availability of the species within the community and surrounding areas;
- (4) few households utilize the species and there is little availability of the species within the community and surrounding areas.

Once all the categories have been discussed, ask for following two additional categories:

- a) Species that were grown ten years ago and are not grown now.
- b) Species that farmers would like to grow in future if seed are provided to them.

ABD in markets

The facilitator will explain that now we want to understand which and how important are the species that were identified in the previous exercise in terms of their marketing, both for sale and for purchase. The facilitators already have the list of species that are sold and purchased. First, the facilitator will explain that the group will examine those species that are sold and then those that are purchased (in many cases may be the same). As in the previous exercise, the facilitator will explain that species can be sold by many farmers or by just a few, and some may be sold frequently and others rarely, thus the facilitator draws a four square diagram (Figure 2). Once the diagram is drawn, the facilitator will read aloud from the list of species that are sold, one species at a time, asking participants to place the species in one of the four cells. Once all species have been classified, the facilitator should probe for additional species that may have been omitted, particularly for those that are sold by few farmers rarely. Finally, the facilitator will ask participants about the general reasons for placing species in a particular quadrant, for each of the four quadrants; the point is not to elicit particular reasons for specific species, but general ones for the set of species placed in each of the cells.

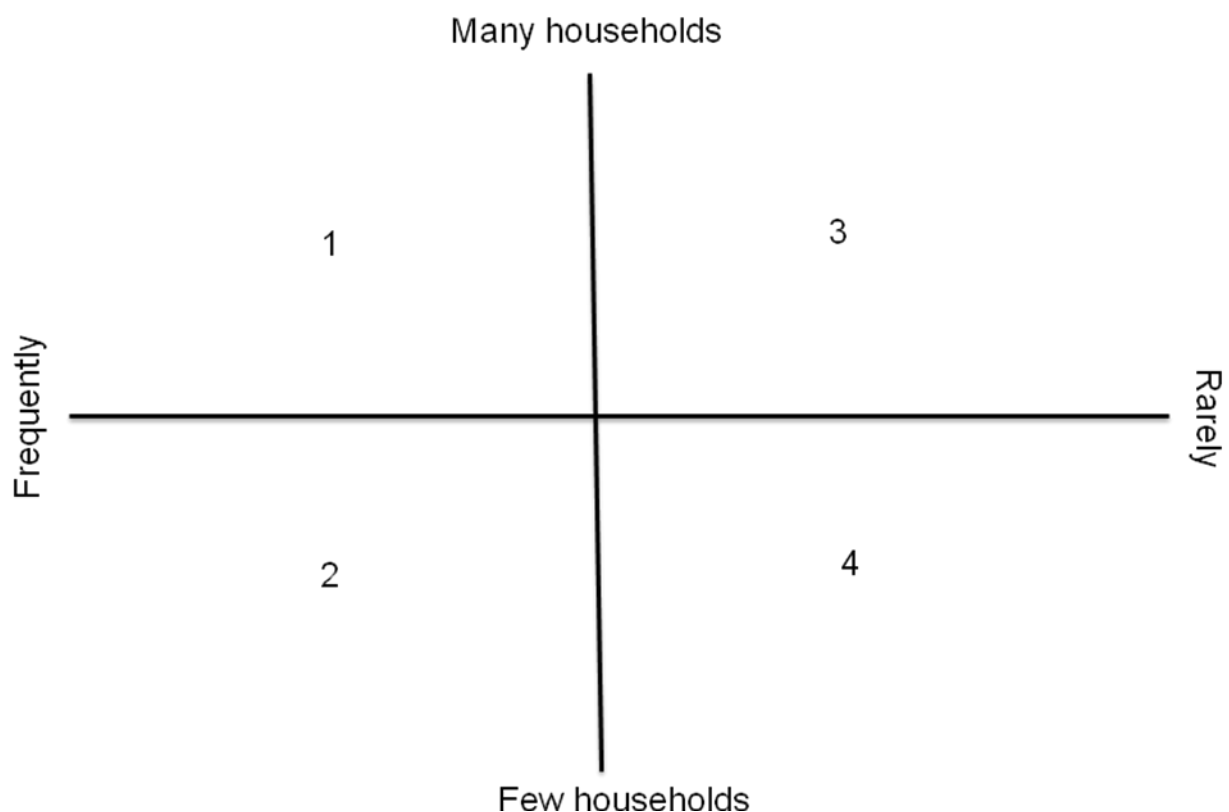
In the case of species sold the four cells will be modified as follows:

- (1) many households sell frequently;
- (2) few households sell frequently;
- (3) many households sell rarely;
- (4) few households sell rarely.

In the case of species purchased the four cells will be modified as follows:

- (1) many households purchase frequently;
- (2) few households purchase frequently;
- (3) many households purchase rarely;
- (4) few households purchase rarely.

Figure 2



Once this exercise is completed, the facilitator will repeat the same procedure with the list of species that are purchased, drawing also a four square diagram with species and foods that are

purchased by many household, by few, and being purchase frequently or rarely (same as Figure 2). After the diagram is drawn, the facilitator will read aloud from the list of species that are sold, one species at a time, asking participants to place the species in one of the four cells. Once all species in the list have been classified, the facilitator will ask the participants to list other foods and food products (e.g. sugar, salt, bread, macaroni, canned foods, etc.) that are purchased but are not be produced locally. After this new list has been compiled, the facilitator will ask participants to place the foods and food products in one of the four cells. Once all species in the list have been classified, the facilitator should probe for additional species that may have been omitted, particularly for those that are sold by few farmers rarely. Finally, the facilitator will ask participants about the general reasons for placing species in a particular quadrant, for each of the four quadrants; the point is not to elicit particular reasons for specific species, but general ones for the set of species place in each of the cells.

ABD and dietary diversity

The facilitator will explain that now we want to understand more about the diversity of foods consumed by the community, particularly about those species that are consumed as foods directly or as food products. Now there is a list with all the locally-available species that are used as foods (derived from the exercise on ABD in production systems), as well as another list with the foods and food products that are not locally available but are purchased (derived from the exercise on purchased foods and food products)². The facilitator reads one by one, each of the species from the list and asks the group to provide information on:

- What parts of the species are consumed?
- What are the cooking methods or methods of transformation used to prepare foods derived from that species?
- What products are derived from the species (through processing)?

This information is noted by the second facilitator in a table. The information will be the basis for developing the dietary diversity questionnaire.

Species	Parts of the species consumed	Forms of preparation/transformation	Products

² In the case of purchased foods and food products there may not be necessary to fill some of the columns since the purchased item is the final product (e.g. products, parts of the species consumed).

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Protocol for the Household Survey

The household questionnaires will be carried with the same households interviewed for the ICRISAT baseline survey in two of the three study villages. It is very important to use an identification system that allows linking the ABD survey with the ICRISAT baseline survey for these households. Additional households will be selected in among the initial list of village households from which ICRISAT's sample was extracted. Since only 71 households were interviewed in the two ICRISAT villages. So we will need to select additional households.

The survey consists of four components:

- (a) useful biological diversity in the production system (on farm, and those species harvested from forest and community land including water resources);
- (b) markets;
- (c) dietary diversity;
- (d) general socioeconomic information.

The survey is divided into two questionnaires. One elicits information on biological diversity, markets and general socioeconomic information. The second one elicits information on dietary diversity for a mother and a child in the household. The questionnaires are provided in two additional files. Specific instructions to elicit the dietary diversity are provided in the specific questionnaire.

For the components on biological diversity, markets and general information, the questionnaire will be applied together to the male head of household, and to the female that will be interviewed for the Dietary Diversity section. The selection criterion for that woman is as follows: (1) a mother in the household between 15-49 years old with a child aged between 6-59 months. If more than one member of the household has these characteristics then choose one randomly (see additional instructions for the dietary diversity section below). (2) If no mother in the household has a child of that age, choose a mother within the age group 15-49 years. If none is available, chose the woman who customarily prepares the food in the household irrespective of age. Most of the questions about species refer to a specific season of reference (either the wet season 2013 or the dry season of 2013/14).

The procedure to carry out the women and child dietary diversity and household food security questionnaire is presented in another detailed document.

For undertaking the household survey, National Partners will hire local staff comprising a team of four surveyors per village with one supervisor for each site. The supervisor will be responsible for overall coordination for that particular site. The four local staff will form two teams of two staff each comprising one male and one female staff.

Bioversity staff will coordinate and monitor the HH survey with National Partners providing any technical assistance required.

ANNEX1

Table to Capture the Results for the Focus Group Discussion for ABD in Production Systems

Village: _____

Date: __/__/____

Type of group: Men () Women ()

Facilitators:

Number of participants: ____

The table below is a tool to record the results of the Focus Group Discussion using the four-square method. One table will be filled for each category of species (e.g. annual species, perennial species, animals, etc.). The work will be carried in the following sequence:

1. Participants are asked to make a list of all relevant species (e.g. free listing of species).
2. Once the list has been completed, proceed to place each species in the appropriate quadrant according to the indication of the participants. It is important to emphasize that the decision to place a species in a particular quadrant should be a group decision, not just made by one member. If there is controversy discuss until consensus is reached, if no consensus then indicate so in the notes.
3. For each species once it has been placed in a quadrant, ask participants the following questions about the species (the answer should be yes or no). One of the facilitators should mark the answers in the appropriate column, as well as any relevant information or observations in the last column:
 - (a) Is the species (parts of it or products derived from it) used as food for own consumption?
 - (b) Is the species (parts of it or products derived from it) sold by community members?
 - (c) Is the species (parts of it or products derived from it) bought by community members?
 - (d) Is the species available during the season of food scarcity?
4. Continue with the next species and repeat the process until all species in the list have been classified.

Category of species: _____

(Mark (√) only if the answer is yes).

Name of species	Quadrant (1,2,3 or 4)	Food for own-consumption	Sold	Purchased	Season of scarcity	Observations	Sold Quadrant (1,2,3 or 4)	Purchased Quadrant (1,2,3 or 4)
maize	1	√	√	√				

In addition, information will be gathered on the following issues:

- a) Are there other species that may not have been included yet, particularly in quadrants 3 and 4? If so include and repeat the process with the additional ones.
- b) Ask what are the general reasons species were placed in a particular quadrant, for each of the four quadrants; the point is not to elicit particular reasons for specific species, but general ones for the set of species placed in each of the cells.
- c) Species that were grown ten years ago and are not grown now.
- d) Species that farmers would like to grow in future if seed are provided to them.