8. SEED SOURCES AND SEED NETWORKS
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This section describes how to collect and analyse information on seed sources, access and exchange. The aim is to understand the local seed system – how farmers obtain and maintain the seeds and other planting materials of the crop varieties that they use.

The information obtained answers questions about:

- The overall availability of seed and the different sources of supply that farmers use
- The relative importance of different sources of supply for different crops and varieties
- The extent and importance of local seed exchange networks
- The identity of key individuals – sometimes called nodal farmers or custodian farmers – in maintaining crop and varietal diversity.

Information on seed sources, maintenance, access and exchange can be used to:

- Explore whether the exchange of seed between individuals within a community constitutes a network
- Identify varieties that are private (maintained by individual farmers and never exchanged) and why this is (practical, cultural or other reason)
- Investigate whether there are differences in the ways that men and women or wealthy and poor farmers access seed for different crops
- Find out who is important in maintaining seed flows or in supplying a range of varieties
- Assess rates of turnover of seed stocks and thus how much the system is changing over time
- Identify the main constraints to seed availability and ways of strengthening access to diverse varieties or new materials.

The information collected should take account of age, gender and other relevant factors that may affect access to or provision of seeds.

Note: Questions about seed management may be sensitive. Individual farmers may not want to be completely open about seed sources for cultural or other reasons.

8.1 CONDUCTING A SURVEY OF SEED SUPPLY PRACTICES

Describing seed supply and seed networks is time consuming. Thus, it is best carried out on only one or two major staple crops. The survey may be carried out as part of the larger household survey (see Section 5: Household surveys).

For the selected crop, ask about the seed source of each variety named by the farmer during the household survey and about the original source of seed.

- What is the source of the seed you have planted?
  - Maintained by yourself from a crop you have grown in the past (self)
  - Relative or neighbour in the same community (gift, exchange, purchase)
  - Relative or contact from another community (gift, exchange, purchase)
  - Market/commercial seed seller
  - Extension service or government agency (gift, exchange, purchase)
  - NGO (gift, purchase)
  - Seed fair

- When did you obtain the seed?
  - You always had it
  - This year
  - Last year
  - In the last two to five years
  - More than five years ago

If maintained by yourself, what was the original source of the seed you are using?

- Always yourself
- Relative or neighbour in the same community (gift, exchange, purchase)
- Relative or contact from another community (gift, exchange, purchase)
- Market/commercial seed seller
- Extension service or government agency (gift, exchange, purchase)
- NGO (gift, purchase)
- Seed fair

The term ‘seed’ is used throughout to refer both to true seed and to other types of planting materials such as tubers, offsets or cuttings.
DATA ANALYSIS

After transferring the answers from the household survey to an Excel spreadsheet the data can be analysed in various ways. For example, the results can be compiled to determine the ways in which seed of each variety is accessed by the community as in Figure 8.1 for Bambara groundnut (note: in this example, the investigators added a category for seeds obtained from relatives). Some varieties were maintained entirely by the farmers that grew them, others were always obtained from markets, while still others were obtained from a number of different sources. The proportion of farmers using the different seed sources can also be calculated as in Table 8.1. Other analyses can be carried out to explore differences between gender or age with respect to seed sources, or turnover (e.g. how often has a variety been exchanged or obtained from a market over the last five years).

Table 8.1 Seed sources for fonio (*Digitaria exilis*) reported by farmers surveyed in Sikasso and Segou regions of Mali. Source: Institut d’Economie Rurale and Bioversity International, IFAD-EU NUS Project.

<table>
<thead>
<tr>
<th>Seed source</th>
<th>Number of farmers with seed source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own production</td>
<td>85</td>
</tr>
<tr>
<td>Relative</td>
<td>28</td>
</tr>
<tr>
<td>Other villages</td>
<td>24</td>
</tr>
<tr>
<td>Market</td>
<td>34</td>
</tr>
</tbody>
</table>

Figure 8.1 Seed sources for different Bambara groundnut (*Vigna subterranea*) varieties reported by farmers surveyed in Sikasso and Segou regions of Mali. Source: Institut d’Economie Rurale and Bioversity International, IFAD-EU NUS Project.
8.2 DESCRIBING LOCAL SEED NETWORKS

Seed network studies provide information on the flow of seeds within a community and on the importance of specific individuals in the community as sources of seeds. The information can be obtained through a three-stage interview process illustrated in Figure 8.2 and explained below.

**Step 1: First-stage interview**
Identify 10–20 first-stage respondents through stratified random sampling (see 'Probability sampling' under Section 2.5: Sampling strategies and sample size).

Ask each first-stage respondent the following questions for each variety they have sown this season:
- From whom did you receive the seeds of this variety for this season?
- Was it as a gift, exchange or purchase?
- Now ask the same questions for the seed of each variety sown in the previous season.

List seed sources for each respondent and each variety in a table like Table 8.2.

**Step 2: Second-stage interview**
Interview farmers who were named as a seed source by the first-stage informants. Ask each of them from whom (s)he took seeds of the variety identified in the first-stage interview. Repeat the questions for the previous season and enter the information separately (see table 8.2).

**Step 3: Third-stage interview**
Ask the same questions of farmers who were named as seed source by the second-stage informants.

**DATA ANALYSIS**

Data about seed sources and modes of exchange can be used to draw maps that show the seed flows (Figure 8.3). Combine all the information on the different varieties and map the connections. Before starting to draw the map, identify the nodal farmers. These are the individuals who were named most frequently as seed sources. Decide on a minimum number of times a farmer must be mentioned in order to qualify as a nodal farmer.

This visual seed network representation shows how many seed sources and different modes of exchange are present for each variety, who are the nodal farmers, whether there are many exchange points and how diverse the modes of exchange are (e.g., a variety may only be sold, or may be both sold and exchanged for other goods).

**Comparing seed networks**

These maps can be used to compare seed networks between communities, for different crop species or varieties and between past and present seasons for a particular crop/variety. For example, Figure 8.3 shows seed networks for rice in two different communities in Nepal, Kaski and Begnas. In Kaski, an upland community with large numbers of traditional rice varieties, exchanges are frequent and there is a rich and highly developed network creating constant flows of seed of important varieties within the community. In Begnas, a community with fewer traditional varieties, there are fewer exchanges and the networks are poorly developed. This may be the result of a greater use of modern varieties obtained from commercial sources. For more information on how to analyze the results of seed network studies, see Ricciardi (2015), Subedi et al. (2003) and Thomas et al. (2015).

Table 8.2 Sources of seed for each variety sown by each first-stage respondent in the current season and previous season

<table>
<thead>
<tr>
<th>Farmer</th>
<th>Variety</th>
<th>Traditional or modern</th>
<th>This Season</th>
<th>Previous Season</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Source (farmer name or other source)</td>
<td>Made of exchange</td>
</tr>
</tbody>
</table>

This table is empty and needs to be filled in with data.
Figure 8.3 Maps of seed networks for rice in two communities in Nepal: Kaski and Begnas. Arrows show direction of seed flows and exchange mode (exchange, purchase, borrow, trial, gift). The variety name is given above the arrow. Source: Subedi et al. (2003)
A focus group discussion (FGD) provides an opportunity to obtain general information on seed availability and seed quality of different crops and varieties in the community and can be used when time is limited or a full-scale household survey is not undertaken.

The FGD on seed supply can be combined with the four cell analysis (Section 6). Once the varieties have all been identified and placed in the different cells, start with the common varieties grown in large areas and for each variety ask the following questions:

- Where can you get seed of this variety?
- Maintained by yourself from a crop you have grown in the past (self)
- Relative or neighbour in the same community (gift, exchange, purchase)
- Relative or contact from another community (gift, exchange, purchase)
- Market/commercial seed seller
- Extension service or government agency (gift, purchase)
- NGO (gift, purchase)
- Seed fair

- Which farmers can supply seeds of this variety?
- Is it readily available, usually available or difficult to obtain?
- What are the limitations on availability (e.g. lack of seed, high cost)?
- Are there problems with seed of this variety (e.g. poor quality of seed, identity not reliable, not available when needed)?

Try to be as specific as possible and ask for individual farmers’ opinions and then see if there is a consensus. Prepare a data sheet summarizing the information on each variety (Table 8.3).

An FGD can also create a diagram of seed supply practices using the following approach.

The facilitator draws squares representing the individuals participating in the FGD on a large sheet of paper and writes their names in each square. These squares are arranged in a big circle around the sheet of paper.

Each farmer then tells the group the total amount of seed (s)he used this season and writes that in their square.

The facilitator then asks each farmer to draw a set of circles around their square for each way in which they obtained the seed and indicate the amount they obtained from each source and varieties involved.

The facilitator can then ask for additional information to add to the picture, such as the identity of a known seed supplier in the community who is not at the FGD meeting.

Once these steps have been completed, the facilitator can annotate the diagram with lines and arrows connecting suppliers of seed to recipients.

### Table 8.3 Table for recording farmers’ opinions on aspects of seed supply in their community

<table>
<thead>
<tr>
<th>Variety</th>
<th>Source</th>
<th>Farmer Sources</th>
<th>Availability</th>
<th>Problems With Seeds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variety 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variety 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variety 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variety 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### FURTHER INFORMATION/REFERENCES

**On seed systems in general:**


**On collection and analysis of seed system information:**

