



Protocol for the Collection of Cross-cultural Comparative Data on Local Indicators of Climate Change Impacts on Crop Diversity Trends

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LICCI
Local Indicators of Climate
Change Impacts

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Definitions

Farmer: people who consider that his/her main activity is farming and identify him/herself as a farmer. Ensure that this people is cultivating by himself/herself.

Young Adult: It is the first age class after childhood where people are involved actively in farming. This should be assessed locally and the local word should be used in each context.

Crop: a plant purposively planted, cultivated for self-sufficiency or commercialization, either perennial or annual. Crop thus include plants cultivated for fiber (e.g. cotton) or for spice (e.g. clove tree), fodder or other uses.

Species: as defined by the botanical classification and identified with their Latin name. Mismatch with local taxonomies are frequent, and researcher should adapt the survey protocol to make sure that they record the different botanical species. It is frequent that several botanical species bear the same vernacular name in local taxonomies, and reversely that one botanical species includes two local species.

Staple: crop that people consume every day during the major part of the year and that are grown in the village.

Main staple: the most consumed staple.

Landrace: variants within species as locally identified and named by farmers. It includes local landraces as well as introduced varieties released by official channels.

Perennial crop: Perennial crops are crops that can survive without replanting for more than two growing seasons, which means they can be harvested several times before replanting is needed.

Non-perennial crops: plants that do not last for more than two growing seasons. In this protocol, for simplicity purpose, we will refer to non-perennial crops as Annual crops.

Field types: the different categories of fields or cropping systems that people distinguish locally, used for communication, and identified using distinct vernacular terms.

Cropping system: refers to the crops, crop sequences and management techniques used on a particular agricultural field over a period of years. It includes all spatial and temporal aspects of managing an agricultural system. It especially encompasses: i. Crop choice (species and varieties), ii. Crop spatial organization, rotation or succession, iii. Tillage, iv. Organic matter management, v. Burning, vi. Water management, vii. Pests, disease and weeds control, viii. Fertilization.

Cropping system descriptors:

- ✓ *Rainfed*: relying only on rainfall.
- ✓ *Irrigated*: application of controlled amounts of water to plants at needed intervals.
- ✓ *Continuously flooded*: control of water in fields to maintain flooded conditions (e.g rice).
- ✓ *Flood-recession*: crops are cultivated after the recession of water on riverbanks or near any water bodies.
- ✓ *Shifting cultivation*: plots of land are cultivated temporarily, then abandoned and allowed to revert to their natural vegetation while the cultivator moves on to another plot.
- ✓ *Permanent cultivation*: plots are cultivated each year (absence of fallow).
- ✓ *Horticultural*: vegetables cultivation, mainly for commercial purpose.
- ✓ *Agroforestry*: woody perennials (trees, shrubs, palms, bamboos, etc.) are mixed with agricultural crops.
- ✓ *Homegarden*: an area of land surrounding a house and planted with a mixture of perennials and annuals.

Farming systems (FAO): a population of individual farm systems that have broadly similar resource bases, enterprise patterns, household livelihoods and constraints. Their description is based on the following criteria: i. available natural resource base, including water, land, grazing areas and forest; climate, of which altitude is one important determinant; landscape, including slope; farm size, tenure and organization; and ii. dominant pattern of farm activities and household livelihoods, including field crops, livestock, trees, aquaculture, hunting and gathering, processing and off-farm activities; and taking into account the main technologies used, which determine the intensity of production and integration of crops, livestock and other activities.

Crop succession or rotation: Crop succession and rotation are the practices of growing a series of different crops in the same area in sequenced seasons. Crop rotation refers to a pattern crops series that is repeated regularly (e.g: alternating finger millet and groundnut repeatedly), while crop succession is a series that is not repeated over time (e.g. growing rice, then cassava, and then planting mango tree.).

Seed relief: actions intended by governments or NGOs to deliver direct forms of seed aid to respond to acute, emergency stresses, i.e aiming at procuring, transporting and distributing seed.

Food / seed self-sufficiency: capacity of the household to produce its own food /seed for the year.

Crop diversity trends protocol

Goal: i. To obtain an assessment of cropping systems and crops cultivated in the field site, ii. to document changes in crop species and landraces, iii. to identify the main factors driving these changes, iii. to assess the perceived impact of climate changes on agroecosystems and associated livelihoods.

The crop diversity protocol follows the same methods and sampling design as described in for the core LICCI protocol (i.e. semi-structured interviews, FGDs, and surveys) and should be conducted as an “extension” of the LICCI protocol, with the same interview partners for the household survey.

Specifically, the crop diversity protocol expands the content of the LICCI methods as follows:

(A) At the **village level**, group interviews aim at **assessing the current diversity of crop species** and of landraces for the main staple, and to **document the local observations of changes in crops** over time and their drivers. A description of the cropping system should also be provided at this level.

(B) At the **household level**, surveys are conducted to assess crop species and landraces currently grown, and record individual farmers’ observations concerning changes in crop and climate change impacts on crop productivity, food sovereignty and income.

Before starting conducting the interviews you should make sure you have clarified a “glossary” with the interview terminology. If possible, run 3-5 pilot interviews to check how the concepts work and train your translator. Examples of tricky concepts are “crop”, “species”, “variety”.

Material needed: A booklet with the picture and the Latin name of all the botanical species of crop expected to be grown in the study area should be printed before going on the field. This booklet will be a reference for the village and individual survey, and will be adapted by adding species that were not included initially or by removing species that are not cultivated. The picture should be clear and display the whole plant in the field, as well as details of its aerial and edible parts. When possible, choosing picture representing the diversity of the variants observed in the area is recommended. During the training workshop in Barcelona, examples of the booklet will be shown.

I. Village level, group interviews

Depending on their knowledge of the study site, the researcher may be able to address part of the points listed below. In this case, researcher don’t need to go through all the following questions during interviews and group discussions and they can choose to target some specific questions for which they need complements.

Approximate time: 45 minutes

Sampling recommendations: at least one group interview should be conducted in each village. Each group should include between **5 and 10 people**. The procedure for sampling will be the same as for the Focus Group Discussion in the main LICCI protocol, but targeting only people that do farming as main livelihood activity. We will use quota-sampling to capture the

variability within the local communities in terms of gender and age. If the partners feel that power relationship may impede some specific group to express their viewpoint freely, they should implement different group interviews. Informants selected for the crop trends protocol can be selected independently from those selected for the core LICCI FGD if needed. Partners can choose to do these group interviews together with the FGD conducted in the core protocol or independently.

Content: In the group interviews we will explore two main topics: (1) assess the diversity of local crops species and that of the landraces and varieties for the main staple crop; (2) document peoples' observations concerning changes in crop and their main drivers, focusing specifically on the impacts of climate change.

Expected Outputs:

Researchers should not submit raw data, but should keep it for a period of 3 years, as it might be required for clarifications. Raw data includes transcripts or recordings of the interviews, field notes, etc. Researchers should produce and submit the following documents summarizing results from these:

1. **A list the crop species currently grown** for food and income in the village (*refer to the Output manual page 1 [part 1]*). Fill the output table by establishing a list with the correspondence between the vernacular species name and the Latin name of the botanical species (Use the species pictures booklet as a reference. Refer to the following sites for the botanical identification: <http://www.theplantlist.org> and <https://www.tropicos.org>).

Indicate:

- What are the three main staple crops in the village, i.e. the crop species consumed the most frequently and grown in the village (up to three, ranked by decreasing order of importance regarding their contribution to food in quantity).
- What are the three main cash crops in the village, i.e. the crop species that contribute most to income (up to three, rank by decreasing order of importance regarding their contribution to income in amount of money).
- Precise if, in the village, each species is cultivated by: i. many people of few people, and ii. if it represents a small or a large part of the cultivated area (“four cells analysis”). Limit to the 15 main species.

2. **A list of the landraces or varieties currently grown in the village for the main staple**, based on the vernacular names used by farmer to identify them (*refer to the Output manual page 2 [part 2]*). Indicate for each landrace or variety:

- If it has other names locally (synonyms). In cases where landraces identification is non-consensual in the village, partners are advised to identify who are the experts/ most knowledgeable people for the cultivation of the main staple crop in the village and invite them to either collective or individual interviews aiming at establishing a consensual list of landraces names and there synonyms. A unique ID will be attributed to each locally-named landrace or variety and will be used as a reference for the individual surveys.

- Their origin, i.e. if people consider that it is: i. a local landrace (it has always been grown in the village as long as they can remember), ii. a landrace introduced from another village, or iii. a modern variety disseminated by a project, an NGO or any official organization.
 - Their rank according to the area they represent in the village.
3. **A description of the different types of cropping systems or fields** and their characteristics. It can be done only once at the site level if little differences exist among villages, or in each village if significant differences exist at this level. The output table may be filled directly by the researcher and its field assistant if they have has a sufficient knowledge concerning the different types of cropping systems in the study area. Alternatively, interviews should be conducted with key knowledgeable informants.
- a. Partners should *fill the table* (*refer to the output manual p.3 [part 3]*) as following: Establish the **list the different types of cropping systems** or fields that people distinguish and name using vernacular names. If different types of cropping systems exist in each category, detail them by indicating the main crops. Provide: i. a brief description of the **biophysical characteristics** of each cropping system type (e.g. topography, soil characteristics, proximity to water bodies, to houses), ii. the **main crop** in these systems and if they are usually associated to non-crop plant species (e.g. shade trees), and iii. **how they are managed** (crop successions and associations, fertilization, irrigation, pests, disease and weed control, tillage). Indicate for each cropping system to **which category** it belongs in the following list: *1. Annual (Non-perennial) crops, rainfed, shifting cultivation; 2. Annual crops, rainfed, permanent cultivation; 3. Annual crops irrigated; 4. Annual crops permanently flooded; 5. Annual crops, flood-recession or riverbanks; 6. Perennial crops monoculture; 7. Horticultural; 8. Agroforestry; 9. Homegarden.* Refer to definitions abovementioned.
 - b. Provide a *brief narrative* to provide a general description of agriculture in the area and provide any useful complementary information about the cropping systems, especially concerning their respective importance in livelihood strategies, their spatial imprint, or their temporal dynamics. If not described in the LICCI core protocol livelihoods narrative, explain what are the main agricultural activities, is agriculture rather subsistence-oriented or marked oriented, what are the main value chains, what are the main constraints, and what have been the major changes that farming systems experimented in the area.
4. **A description of the crop diversity trends**, i.e. changes in crops over time in the village. Partners are expected to provide:
- a. **A list of the local observation of crop changes and their drivers.** Ask people what changes they observed since they started farming concerning: i. crop species and ii. the landraces or varieties for the main staple (*refer to the Output manual page 4 [part 4]*). To obtain this information use a benchmark (since you were a young adult). Be careful to not use the term climate change. **Explore the causes/drivers of changes noticed.** Note down causal relations noticed by people

(i.e., driver of change, consequence of change, cascading effect). Specify in the dedicated columns those changes/impacts that people or you consider directly or indirectly associated to climatic factors. Notice that not all these changes will be classified as LICCI (i.e. climate related).

- b.** A **short narrative** that goes together with the change table, detailing the timing and drivers of these changes and their consequences on people livelihoods in the village.

II- Household level survey

Approximate time: about 30 minutes.

Goal: The aim of the survey is to collect information at the household level on changes in crop species and landraces observed by the household heads since they started farming by their own (i.e. do their own choice for crop), and their perceptions of LICCI related to crop and cropping systems. The survey will include questions regarding: the current agroecosystem and crop cultivated, and changes in crop species and landraces for the main staple.

Household sampling: Each researcher should conduct a minimum of **60 surveys** at the site level. Households should be selected among those surveyed for the core LICCI protocol, following simple random selection as specified in this core protocol.

Individual sampling: Within each household, this survey should be conducted preferentially with both household heads (men and women). When not possible, it can also be conducted only with one of them if his/her knowledge of the crops cultivated in the household is enough. The crop trends survey is expected to last about 30 minutes, and it can be conducted during a second visit if the researcher feels that doing it together with the core LICCI survey is not convenient.

Protocol: The survey takes the form of a close-ended questionnaire including three main components: 1) Cropping systems assessment; 2) Crop species and landraces trends; 3) Sources of planting material or seeds used by farmers to get new crop in relation to change in climate; 4) Climate change impacts on agricultural production, self-sufficiency and income. The recommendations for the individual survey in the main protocol should be applied here.

Expected outcomes: a minimum of 60 surveys completed.

The survey includes the following sections, detailed in the *Output Manual p.5-10*:

1. Interviewee identity

Basic information to identify the interviewee, to be reported from the core survey if they were already collected with the same interviewee.

2. Cropping system assessment

List the different fields of the household and the crop planted on each of it over the last cropping year. If there are two cropping season, list the crop planted during each. Indicate if chemical or organic pesticides and fertilizers were used in the farm of the last year.

3. Trends in crop species and landraces/varieties for the main staple

List the changes the interviewees observed since they started farming concerning: i. crop species and ii. the landraces or varieties for the main staple. Follow the same procedure as for the group interview at the village level: list the drivers either LICCI (i.e. climate related) or not.

4. Seed/propagules sources

For the species and variety/landraces of the main staple that were adopted by the household along time, indicate where the household get planting material for the first time (precise the nature and the origin of the source).

5. Climate change impacts on farming systems

Explore the impact of climate change on the productivity of crop and household livelihood, if this was not already explored in the LICCI core survey. Ask the interviewee whether he/she consider that the best option to adapt to the changes experiment is crop diversification or specialization.