LICCI

Local Indicators of Climate Change Impacts

Master Manual

Version 1.4 (updated on January 1, 2020)

Content

Updated content

Change	Section	Responsible person	Date of change
Add definitions of the five livelihood assets (human, natural, social, financial, physical)	Main manual, definitions	Anna Schlingmann	23.09. 2019
Examples for adaptation and coping added	Definitions	Anna Schlingmann	02.10.2019
Add question "why" in survey when adaptation/coping measure is applied	Household survey, adaptation part	Anna Schlingmann	23.09. 2019
Table of adaptation/coping drivers to categorize responses to "why" question in adaptation part	Household survey, adaptation part	Anna Schlingmann	01.10.2019
Revise Tbl. Adaptation/coping barriers	Survey, Adaptation, adaptation/coping barriers	Anna Schlingmann	01.10.2019
More detailed description of how to formulate the adaptation question in the survey	Selection of adaptation/coping for survey	Anna Schlingmann	04.10.2019
Replace flow chart of data delivery	Main manual and Output manual	Petra	27.09.2019
Add flow chart that shows what tool to use to deliver the data (LICCI app, project send)	Main manual and Output manual	Petra	27.09.2019
Revisit/clarify selection of Wealth items	SSI, section now called "Ownership of assets with a market value"	Viki	25.09.2019
Include definition of food/water access (security vs. sovereignty)	Definitions	Viki	27.09.2019
Clarify on writing workshop and statistical support	Publication policies	Viki	27.09.2019
Protocol for the measure of TEK (including Christoph's proposal)	Full protocol after this table. Then repeated in	Viki	27.09.2019

	corresponding section and in csv		
Add definitions of animal husbandry, wild animals, easy & hard seasons,	Village card	David	01.10.2019
Add livelihood activities missing: gathering, whaling etc.	Definitions	Viki/André	02/10/2019
Add sentence about DMP being live document	DMP at the end of the manual	Petra	02/10/2019
Re-phrase for clarity; number of surveys (175 individual; 125 household)	Sampling	Anna P	23/10/2019
Added explanation about "Village_social_capital"	Village Card	David	25/10/2019
Added explanation about inclusion of ID_protected area and IP_Recognized_territory	Site Card	David	25/10/2019
Merged "site narrative" and "timeline narrative" in "timeline narrative"	SSI Section 1 - Timeline	David	25/10/2019
Re-phrase the definitions and instructions for the seasonal calendar	Seasonal calendar	Vincent	26/10/2019
Re-phrase the site timeline	Site timeline	Vincent	26/10/2019
Change the definition of landrace and modify the wording of the crop trends part of the survey to make it consistent	Definitions and survey	Anna P	31/10/2019
Update the LICCI classification and final edits of the document.	LICCI Classification	Xiao/André	05/11/2019
Added Christoph Schunko´s publication topic	Publication policies	Xiao	05/11/2019
Added definition of secondary school	Definitions	David	13/11/2019
Add an important note about what to bring to the FGD	FGD	Xiao	12/26/2019

Protocol for measuring Indigenous and Local Knowledge (ILK) in the LICCI project

We are interested in a very broad measure of ILK related to common livelihood activities as a proxy for one important type of human capital (just in the same way we are asking for school grade). Here is the protocol on how to obtain this broad measure

During SSI

During the first part of SSI, when conducting interviews about livelihood strategies, you should also explore ways of asking for variation of ILK within the society. For example, some groups have specific names for expert hunters or fishers, and some other groups mention that ancestors have higher knowledge. Remember we are asking about variation in ILK related to their livelihood activities (not expert or sacred knowledge), a domain of knowledge that should be familiar –to some extend- to most people. If division of labor is gendered, make sure you ask about men's and women's activities.

Thus, during interviews on livelihood strategies, you should ask something like "Are there people/group of people who have more knowledge about *[activity]?" or "*How will you know if someone is very knowledgeable about *[activity]?"* Ask this question regarding all livelihood activities common in your area and note who are the people locally considered knowledgeable (e.g., elders, ancestors, chief). Specifically, we need to know who is more knowledgeable about wild plant and fungi uses.

When preparing the survey

We need to select two activities to be asked to all individuals participating in the survey. If division of labor in your site is gendered, then select an activity in which (a group of) men are often mentioned as most knowledgeable, and another one in which women are more often mentioned. If the division of labor follow other structure (i.e., cast), then use that to select the two activities.

For testing the survey, select four activities. We have seen in the past that asking about expertise in some specific activities might be sensitive, so select an activity that does not make people uncomfortable. So, it is good to test several activities to select two to be included in the final survey. Gathering of wild plants for food is the activity added automatically to the survey.

Measuring ILK in the survey

We will rely on self-assessment with common baseline of "knowledgeable people in the village" (however this is locally defined). In the survey, you should include questions related to two activities (plus gathering wild plants for food, which is automatic), and ask as appropriate. They should take this form:

- Compared to [*knowledgeable group*], who are knowledgeable on [*activity*], how much of their knowledge about [*activity*] do you have?

Answer categories:
- I know hardly anything they know about [*activity*]
- I know some things they know about [*activity*]
- I know a lot they know about [*activity*]
- I know everything they know about [*activity*]

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Definitions

Adaptation: The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects (Oppenheimer et al., 2014). Example: Shifting cultivation towards drought-resistant crops or varieties.

Adaptive capacity: The ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences (Oppenheimer et al., 2014). The ability of a system to evolve in order to accommodate environmental hazards or policy change and to expand the range of variability with which it can cope (Adger, 2006, p. 270). Much of the current determinants for adaptive capacity are driven from vulnerability research and are largely based on the Sustainable Livelihood Framework which comprises five assets categories – human, social, natural, physical and financial capital – from which livelihoods of people are built (Scoones, 1998; McCarthy et al. 2001, Serrat, 2017; Defiesta and Rapera 2014). Specifically, a) Financial capital – income from different sources, savings, credit; b) Physical capital – ownership of productive assets and access to communal assets; c) Human capital – formal education and local knowledge; d) Social capital – membership in associations, social relations in the village, and perceptions of trust and cooperation; e) Natural capital – land ownership and access to communal resources (Scoones, 1998).

Livelihood functions of assets include a) Productive assets – income (resource generation); b) Consumptive assets – consumption and reproduction; c) Convertible assets – savings (cash).

Administrative center/market town: The closest administrative center is the place where people must go to process paperwork (i.e., national identity card or passport). The closest market town is the place where people go to buy/sell basic products on a regular basis (i.e., not seasonal or weekly markets, but a place where there are always trading activities taking place). The two might be the same, but the market town is likely closer and smaller, and more frequently visited.

Airport: see definition *Transportation facilities*

Animal Husbandry: Animal husbandry can be looked at in three broad categories as depicted by Choudhury and Jansen (1999). *Nomadic husbandry* is a form of husbandry where the husbandry with the way of life of the groups that practice it are fundamentally intermixed. Nomadic husbandry does not have any complementarity or association with working on the land. It is the principal activity of a group or tribe, organized in part based on access to water resources. *Transhumant husbandry* is generally a periodic, seasonal movement of livestock to use seasonal pastures. This form of husbandry is characterized by strong specialization in the village population among shepherds, herders and cultivators. *Sedentary husbandry* is found in areas of abundant natural resources all year round. This form of husbandry includes the management and use of livestock, where the movements take place within the same area of farmland. It is practiced in association with or is complementary to working the land. There can also be a system of agropastoralism surrounding the villages.

Coping: The use of existing resources to achieve various desired goals during and immediately after unusual, abnormal, and adverse conditions of a hazardous event or process (Agrawal and Perrin, 2009). Examples: pre-harvesting crops before a hurricane; transplanting tomatoes into a pot inside the house during a hurricane and (re)transplanting them back to the garden afterwards; selective irrigation with unreliable and limited surface water

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

Exposure: The nature and degree to which a system experiences environmental or socio-political stress. The characteristics of these stresses include their magnitude, frequency, duration, rapidity of onset, and areal extent of the hazard (Adger, 2006, p. 270).

Financial capital/asset: see definition *Sustainable livelihood approach*

Food/Water access: The LICCI protocol collects information that will allow researchers to differentiate the type of access and rights people maintain to their food and water. Eventually this would allow us to assess different situations and particularly

- ***Food/water security:*** a measure of the availability of food/water and individuals' ability to access them. Food/water security is considered to exist when people, at all times, have physical and economic access to sufficient, safe and nutritious food/water to meet their dietary needs and food/water preferences for an active and healthy life (FAO, 2003).
- ***Food/water sovereignty:*** the right of peoples to healthy, safe, and culturally appropriate food/water produced through ecologically sound and sustainable methods.

See the Nyeleni Declaration (2007) for food sovereignty and Jepson et al. (2017) for discussions on water security and its measurement.

Hospital vs. Health post: For the purpose of this work, we consider a hospital an institution providing medical and surgical treatment and nursing care for sick or injured people. We differentiate hospitals from health posts, defined as a community health organization providing ambulatory health care and referrals to specialized health services and not providing surgical treatment. The main purpose is to provide basic health services to people who live in rural areas.

Household: A household is defined as a group of people (normally family members) living under the same roof, and pooling resources (labor and income). Labor pooling means that household members exchange labor time without any payment, e.g., on the farm. Income pooling means that they “eat from the same pot”, although some income may be kept by the household member who earns it. One should also note that it is possible to have household members who are no blood relatives of the family, e.g., a household servant, an in-law, or someone taken into the household because they have been orphaned or otherwise destitute (Sunderlin et al., 2016).

In most cases the members of the household are easily identified, but following are some more complex cases and indications on how to deal with them:

Polygamy: If a person has several partners, each living in separate houses, then all the houses of the partner should be treated as a unique separate household.

Several families living together in one house: If there is resource pooling, they should be treated as one household, otherwise not. An example, a married son still lives in the house of the parents. If his family's economy is separated from the one of his parents (no income pooling, and they only occasionally eat together), they should be treated as two separate households.

Family members living far away part of the time, e.g., working or going to schools: Include if they are more or less fully integrated in the household economy (e.g., school children living away during the week, but parents paying for their expenses). In other cases where children have left the house to work and take care of themselves, but contribute some income to the remaining household, they should not be included in the household.

Extended households sharing resources: In some situations, an extended family may be living in different houses, but sharing the same land and income, and eat most of their meals together. Again, following the household definition of "resource pooling", the extended family should be treated as one household, although they don't sleep under the same roof.

Unipersonal households: One may have single person households, e.g., a widow living alone (Sunderlin et al., 2016).

Household head: The household head is normally well defined by formal or informal rules and corresponds to the person or persons who take decisions on the household labor and income. For the LICCI survey we consider both the male and the female (or females, in cases of polygamous arrangements) as heads of a household. If several generations are living together in a house and they share production and consumption, more people might qualify as household heads for our purposes.

Human capital/asset: see definition *Sustainable livelihood approach*

Indigenous and Local Knowledge Systems (ILK): Indigenous and local knowledge systems are social and ecological knowledge practices and beliefs pertaining to the relationship of living beings, including people, with one another and with their environments. Such knowledge can provide information, methods, theory and practice for ecosystem management (IPBES, n.d.). In the LICCI project we are interested in a very broad measure of ILK related to common livelihood activities as a proxy for one important type of human capital (just in the same way we are asking for school grade).

Indigenous Peoples and Local Communities (IPLC): Indigenous peoples and local communities (IPLCs) are, typically, ethnic groups who are descended from and identify with the original inhabitants of a given region, in contrast to groups that have settled, occupied or colonized the area more recently (IPBES, n.d.). Indigenous peoples have argued against the adoption of a formal definition at the international level, stressing the need for flexibility and

for respecting the desire and the right of each indigenous people to define themselves. Reflecting this position, the former Chairperson of the Working Group on Indigenous Populations, Erica Daes, noted that "indigenous peoples have suffered from definitions imposed on them by others". Consequently, no formal definition has been adopted in international law.

Indigenous territory: is an area of land legally set aside for the use of Indigenous peoples in a country that is largely populated by non-Indigenous peoples. Synonyms include the terms 'Indigenous protected areas' and 'indigenous and community conserved area'.

Landrace: annual and biennial crops that have been continuously reproduced by farmers for more than one generation (30 years or more) in the geographic area of study. For perennial crops and crops with vegetative reproduction, we use the term landrace when a specific crop has been cultivated and reproduced in the area for more than 60 years. Farmers have selected these crops from among domesticated or wild species and have adapted them to the local environmental conditions and to the local agrarian culture, uses, and management (Calvet-Mir et al. 2011, Calvet-Mir et al. 2012). For the survey of the LICCI protocol we aim at understanding the changes in the farming system that affected crop diversity. For that, we include in the survey any variant within a given crop species that farmers can identify and name. This means that we include both, landraces and introduced varieties released by official / informal channels.

Land tenure: In the LICCI project we follow the FAO definition of land tenure (2002). FAO defines land tenure as the relationship, whether legally or customarily defined, among people, as individuals or groups, with respect to land. Land tenure is an institution, i.e., rules invented by societies to regulate behavior. Rules of tenure define how property rights to land are to be allocated within societies. They define how access is granted to rights to use, control, and transfer land, as well as associated responsibilities and restraints. In simple terms, land tenure systems determine who can use what resources for how long, and under what conditions. Land tenure is often categorized as:

- *Private:* the assignment of rights to a private party who may be an individual, a married couple, a group of people, or a corporate body such as a commercial entity or non-profit organization. For example, within a community, individual families may have exclusive rights to residential parcels, agricultural parcels and certain trees. Other members of the community can be excluded from using these resources without the consent of those who hold the rights.
- *Communal:* a right of commons may exist within a community where each member has a right to use independently the holdings of the community. For example, members of a community may have the right to graze cattle on a common pasture.
- *Open access:* specific rights are not assigned to anyone and no-one can be excluded. This typically includes marine tenure where access to the high seas is generally open to anyone; it may include rangelands, forests, etc., where there may be free access to the resources for all. (An important difference between open access and communal systems is that under a communal system non-member of the community are excluded from using the common areas.)

- *State:* property rights are assigned to some authority in the public sector. For example, in some countries, forest lands may fall under the mandate of the state, whether at a central or decentralized level of government.

Livelihood activities: Livelihood activities refer to the different ways in which people secure their subsistence. The types and definitions of livelihood activities considered for this work are listed below.

- *Agriculture, horticulture, agroforestry and silviculture.* Activities that involve active plant cultivation, including the processing of derived products (e.g., oils, flours, wood). This livelihood activity **does not** include the collection of non-timber products from natural or semi-natural ecosystems (e.g., honey, fibers), neither the extraction of timber; these are included under the categories ´gathering of non-timber terrestrial resources´ and ´extraction of timber´, respectively.
- *Animal husbandry / pastoralism*. Activities concerned with the care of animals that raised for meat, fiber, milk, eggs, honey or other products, or for farm activities (e.g., transport, plowing, etc.). It includes day-to-day care, breeding and raising of livestock. For the purpose of the LICCI project, we do not include the raise of animals for household consumption (i.e., chicken, ducks,) as a main livelihood activity, except in cases where raising these animals is a major livelihood activity and the numbers are relatively high.
- *Hunting/whaling/trapping*. Activities related to hunting/whaling from natural ecosystems, including the processing of derived products (e.g., fats, skins).
- *Fishing and aquaculture*: Activities related to fishing from natural ecosystems, including the processing of derived products, as well as farming of aquatic organisms, including fish, mollusks, crustaceans and aquatic plants.
- *Gathering of non-timber terrestrial resources*. Activities related to the extraction and processing of non-timber products from natural or semi-natural terrestrial ecosystems (e.g. wild berries, mushrooms, honey, fibers, resins, fruits, useful plants). If the products come from plant cultivation, they should be categorized under ´agriculture, horticulture, agroforestry and silviculture´.
- *Extraction of timber.* Activities related to the extraction and processing of timber from natural or semi-natural ecosystems. Does not include timber obtaining from plantations (these should be included under ´agriculture, horticulture, agroforestry and silviculture´).
- *Mining*. Activities related to the extraction of mineral resources (e.g., metals, sand, clay, etc.).
- *Wage labor not related to natural resources*: Activities for which the person receives a payment in kind, and which involve work not directly related to natural resources (e.g. teacher, health worker, driver, etc.). As the main hypotheses of the work relate to people's interaction with the environment, it is adequate to exclude from this category activities related to natural resources (e.g., an employee of a fishing company, or someone who works as a rancher for a cattle farm).
- *Own business*: Activities related to the ownership and management of own businesses (e.g., shops, restaurants, brick making, etc.).
- *Other(s)*: Any activity that is not included in the categories above, for example tourism, arts and crafts etc. If needed, more than one ´other´ category can be created. Specify the activities that are included in the newly created categories.

Local Indicators of Climate Change Impacts (LICCI): Indigenous Peoples and Local Communities' first-hand observations of changes in local weather and climatic variability as well as changes in local social-ecological systems which are attributed to climate change and grounded on people's interaction with their direct environment. These qualitative place-based observations of climate change impacts can be then categorized in indicators, or more general descriptions of observations; what we call 'local indicators of climate change impacts' (LICCI).

In turn, LICCI can be grouped based on the natural element or process reportedly being impacted, which can be then further grouped in sub-systems ultimately corresponding to the four main systems: climatic, physical, biological and socioeconomic. The most current classification of LICCI in the project can be found in https://licci.eu/ressources/licci-classes/index.html.

LICCI core team: PI, postdocs, PhD students, and technicians hired by the LICCI project at ICTA-UAB, as well as the following researchers who have fully participated in the LICCI project from the start: P. Benyei, D. García-del-Amo, V. Labeyrie.

LICCI partner: PhD students, postdocs, scholars, and/or independent researchers recruited to collaborate with the LICCI project.

LICCI Partner dataset: A single dataset from one research site and collected by one of the partners is considered an individual or partner dataset.

LICCI dataset: The LICCI dataset is defined as any aggregation of more than two individual datasets. The LICCI full dataset includes data from all the sites. The LICCI partial dataset refers to any subset of at least two partners' datasets merged /combined/analyzed together using a comparative approach.

Natural capital/asset: see definition *Sustainable livelihood approach.*

Natural Protected Area**:** A natural protected area is a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, with the goal to achieve the long-term conservation of nature with associated ecosystem services and cultural values (IUCN, 2008 in Dudley, 2008). For the purpose of LICCI project we consider the first declaration of an area as protected under any category, independently of posteriors changes in the surface or type of protection.

Organization (formal and informal): An organization is a collection of people who work together to attain specified objectives. There are two types of organization structure: formal and informal organization. An organization is said to be **formal** when people follow a formal relationship, rules, and policies are established for compliance, and there exists a system of authority. Examples of formal organizations include NGO groups, organized agricultural groups, religious groups, political groups, etc. An **informal organization** refers to spontaneous forms of organization that emerge when people meet, interact and associate with each other with a specific goal, for example, when people meet for story-telling, performing artisanal activities, and/or for managing the common resources of the village without an organized structure, membership patterns, etc.

Physical capital/asset: see definition *Sustainable livelihood approach.*

Port*:* see definition *Transportation facilities.*

Seasons (easy and hard seasons): The LICCI project uses the Köppen-Geiger climate classification (Peel et al., 2007), which classifies different climates of the planet into five large groups: tropical, arid, temperate, continental, and polar-alpine climate. Each geographical area has a different number of seasons throughout the year depending on rainfall and temperature variations, usually 2 or 4 different seasons. The choice of "easy" and "hard" season will be a partner´s decision, it should be site specific and always refers to the accessibility of the village to the market or the nearest administrative center. Normally, the "hard" season is the rainy season or the coldest (winter), because it makes access to the community more difficult, and requires more time and/or money. In some other cases, such as communities located along the rivers in the tropical forest, the dry season could be the "hard" season due to temporal isolation of the community caused by low level/scarcity of water.

Secondary school: In the LICCI project, secondary school encompasses the education and training that a person receives after primary / elementary school and before university, including middle school and high school, in some context, technical schools are also included in this definition.

Site: A LICCI site is defined as a group of villages or households where a LICCI partner dataset will be collected. A LICCI site should display a relative environmental and socio-cultural homogeneity, so the perceived impacts do not change due to different environmental conditions or socio-cultural backgrounds. While it is difficult to have a specific definition of "homogeneity", one relevant criterion is whether people themselves consider themselves part of a group. In general, each participant will have one study area, although some of the postdocs in the LICCI Core Team might have two. Study areas should include information from a minimum of two and a maximum of five villages (exceptional cases should be discussed with the LICCI core team) with relatively homogeneous characteristics and generally representative of other villages (i.e., try to avoid special cases). Please consult the LICCI core team for specific doubts regarding your site.

Social capital/asset: see definition *Sustainable livelihood approach.*

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.

Subjective well-being: is 'a person's cognitive and affective evaluations of his or her life (Diener et al., 2002, p. 63). The cognitive element refers to how the person thinks about his or her satisfaction with life in global terms (life as a whole) and the affective element refers to emotions, moods and feelings. Life satisfaction can be measured using a questionnaire such as the 10 or 5 item satisfaction with life questionnaire (Pavot and Diener, 1993). Affectivity can be measured by differentiating between positive affect negative affect. In this project, our measure of wellbeing focuses on life satisfaction.

Sustainable livelihood approach: The measures of natural resources dependency and vulnerability are framed within the "sustainable livelihood approach", a theoretical approach that organizes the factors that constrain or enhance livelihood opportunities, and shows how they relate (Serrat, 2010, p.1), in this particular case in relation to climate change impacts. A central notion is that different households have different access to livelihood assets, among which households often made trade-offs and choices comprise (Scoones, 1998; Serrat, 2017, p.23; DFID, 2001):

- Financial capital, e.g., cash, savings, credit and debt (formal, informal), remittances, pensions, wages, and other economic assets.
- Human capital, e.g., skills, knowledge, education, good health, physical capability, nutrition, capacity to work/ability to labor, capacity to adapt.
- Natural capital, i.e., natural resource stocks (soil, water, air, genetic resources etc.) and environmental services (hydrological cycle, pollution sinks etc.), e.g., land and produce, water and aquatic resources, trees and forest products, wildlife, wild foods and fibers, biodiversity, environmental services.
- Physical capital, e.g., infrastructure (affordable transport systems, roads, vehicles, secure shelter and buildings, water supply and sanitation, energy, good communications, access to information), household goods and utensils (e.g., refrigerators, radio), productive capital that enhance income, such as tools and technology (tools and equipment for production, e.g., rickshaws, sewing machines, seed, fertilizer, pesticides, traditional technology, other agricultural equipment).
- Social capital, e.g., networks and connections (patronage, neighborhoods, kinship), relations of trust and mutual understanding and support, formal and informal groups, shared values and behaviors, common rules and sanctions, collective representation, mechanisms for participation in decision-making, leadership.

Transportation facilities refer to any existing land/water/air infrastructure used for the transportation of persons or goods. For the purpose of this project, we define:

> **Closest airport** as any airport infrastructure where any type of plane can land, from a sandy road to an international airport.
>
> **Closest port** as any place where ships, boats, or canoes can load or unload. It refers to both river and sea transportation.
>
> **Village road access** as any road where motorized vehicles can circulate, including roads that are only operational part of the year (i.e., during the dry season, or when there is no snow).

Village/community: For purposes of LICCI research a village/community is defined as the lowest administrative unit in an area, normally under the jurisdiction of a village leader/council. In some contexts, a village can be very large, i.e., several thousand households, while in others it can be rather small, i.e., 20 households. Using villages with very different sizes across the LICCI project can cause some biases when it comes to comparing them. If the villages have more than 500-1000 households one should consider breaking it up into smaller units and sample one or a few of them. The selection of villages should be done in coordination with the LICCI Core Team.

Village road access: see definition *Transportation facilities*.

Vulnerability: The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt (IPCC, 2014, p.128).

Wild animals: In the LICCI project, we consider wild animals as a supply of bushmeat and other wild animal products. We consider the four categories described by Ntiamoa-Baidu (1997, p.52). *Production from the wild:* National parks, unprotected forests and savannah lands, including secondary forests and farmlands, account for the greater proportion of bushmeat production in many countries. In areas where wild animal populations densities are high, it can be an alternative source of food. *Game ranching:* comprises the maintenance of wild animals in defined areas delineated by fences. It is a form of husbandry similar to cattle ranching, the animals are managed on natural vegetation although the habitat may be manipulated to improve production efficiency. *Game farming:* involves the confinement of wild animal species in a semi-domestic state where they are fed and grown to required weights and exploited for consumptive use. According to Eltrigham (1984), wild animal species that are farmed are no longer truly wild and represent an intermediate stage between wild and domesticated species. Common animals currently farmed include the ostrich, crocodile and various duiker species. *Wild animal domestication:* by definition, domestication refers to the process which results in genetic adaptation of wild animals to the extent that the animal breeds readily in captivity and its owner has some control over its reproduction. (Eltrigham, 1984; Hudson et al., 1989). The process results in detectable differences between the domestic species and their wild progenitors. By this definition, the fact that a wild animal species is tamed or is raised like conventional livestock does not make the animal domesticated although the process might eventually lead to domestication.

Permits and agreements (Free Prior Informed Consent)

General guidelines for doing research with IPLC

Below are some guidelines for doing research with people in general and with IPLC in particular. Guidelines are to be used as "guide" for partners who have ethical clearance from their own institutions, but they are mandatory for LICCI partners who do not have their own institutional ethical clearance and are under the UAB Ethical Committee clearance.

Sources of material: Research material for the LICCI project includes primary data from GPS, interviews, surveys and group discussions with adults following the protocols specifically provided for that purpose. LICCI partners are responsible for obtaining any other permit required for any other data collection.

Potential risks: Obtaining the Free Prior and Informed Consent (see below) from the organizations and villages where we will work and explaining the project in detail to the participants will help to reduce any potential risks during the project. This research does not involve greater than minimal risk because we will only collect interview data with questions that have been asked before in many surveys and in many ways, so we do not anticipate that the questions will cause discomfort or embarrassment. Accidental breaches of confidentiality are very unlikely but, even if these occur, they should pose no serious physical, psychological, social, economic, or legal risks. Throughout the fieldwork phase, LICCI partners should stress that participation is voluntary, and that participants can opt out of the research in whichever phase except once results are published. For future publications, data from participants who opt out will no longer be used. Participation should not involve any cost to participants except for the time they give in answering the interview questions. If the village participants perceive any potential risk in the project, we will stop the project until it adequately addresses the potential risks presented by participants.

Recruitment and informed consent: In each site, LICCI partners should obtain Free Prior and Informed Consent (FPIC) to conduct the research. Overall, researchers should be aware of internal local power dynamics and try to obtain consent from the highest hierarchies first. In general, FPIC should be obtained

- From the umbrella organization of the group (i.e., "representative" forms). This consent should be obtained in written form;
- From the villages where data will be collected (i.e., "village" forms). Before any data collection starts, LICCI partners should organize a preliminary visit to each village involved in the project to hold a meeting with the purpose of presenting the idea of the project and asking for consent to participate. In these community meetings we will present detailed information on the objectives and scopes of the study, the participation of subjects, and the costs and benefits associated with their participation. Ideally, this consent should be obtained in written with the signature of adults present in the meeting. In this meeting LICCI partners should also hold an open discussion to elaborate a "community engagement protocol" in which the participants have the opportunity to ask in which way they want the information to be returned, or other requirements (see "Community Engagement Protocol").

- From each individual (i.e., "individual" forms). We will have a written consent form for subjects who are literate, and an oral script for illiterate people. The oral script should be signed by a witness.

Protection of confidentiality: Data will be digitally collected and stored in databases. Personal data will only be accessible to the partner collecting the data and the LICCI core team members. LICCI partners should not share personal data of the participants with anybody outside of the research team including journalists. ***Any publication resulting from participation in the study will not identify subjects or villages by name***.

Data export: Data to be collected under the LICCI project consists of information obtained through the implementation of semi-structured interviews (SSI), focus group discussions (FGD), and a survey in each site where the project will be executed. This includes some personal data of the research participants. Each LICCI partner is responsible for storing safely a local copy of his/her own dataset, but personal data of the research participants should not be disclosed to anyone outside of the research team (use password protection for all electronic devices). LICCI partners will receive training by the LICCI coordinating team on how to store a local copy of their dataset and on how to protect the personal data of the research participants. Part of the dataset will be transferred and stored in a secure server at UAB in Spain. LICCI partners should contact the national authority for data protection control in the country where they are collecting data and verify and follow any procedure for data export that applies in their case. If authorizations for data export are required in the country where research is being conducted, the LICCI partner is responsible for obtaining it and sending a scanned copy to the LICCI core team. No personal data will be exported from the EU to countries outside of the EU.

Intellectual Property Rights: The collection of local knowledge raises concerns about the intellectual property rights of this knowledge, especially when LICCI partners collect local knowledge for commercial purposes (e.g. bioprospecting or screening for pharmaceutical products). The purpose of this research project is to document local knowledge on indicators of climate change; however, since LICCI partners know the local contexts best, partners should be aware of potential sensitive issues (e.g. water availability may lead to conflicts on water stress) and bring these up with the LICCI core team as they deem fit. We will use a Creative Commons 3.0 license https://creativecommons.org/ for aggregated data that will be uploaded on the LICCI platform. This license allows sharing and adapting of data under the condition that appropriate attribution is made. Ultimately, the IPLC involved in this research will still have full ownership of the information they provide.

Respect and engagement: In order to increase engagement and show our respect to the local institutions of each IPLC participating in this project, we will respect their authority to ask for a presentation and explanation of the progress of the project at any time, to be presented in formal general assembly's and/or official meetings in the village or in the regional Indigenous representative's office.

Climate-conscious research: It is highly recommended that LICCI partners and core team members adhere to climate-conscious research practices where carbon emissions are

minimized (e.g., taking less carbon-intensive transport, practicing energy efficiency) before, during, and after data gathering.

Working with translators and/or research assistants

In many cases partners will work with local research assistants and/or translators. Working with translators can be extremely challenging, but also very rewarding. A key aspect to achieve the second, while minimizing challenges, is to work with local research assistants/translators as collaborators and provide them with enough time and training to absorb the purpose of the study. For general considerations on working with a local team, please read Hiring, training and managing a field team by Jagger et al. (2011).

Consider including your assistant/translator as co-author in your publications, particularly in cases when they have done important contributions to interpreting the information collected.

Visa and official permits to work in different countries

Each LICCI partner is responsible for obtaining the appropriate visa that allows him/her to conduct research in the country of the selected site (if needed), as well as any official research permit required. Permits might vary from one country to another and depending on the nationality of the researcher, the following permits might be required:

- LICCI partner's visa
- Permit to work in Protected Area and/or officially recognized indigenous territories
- Permit to work with IPLC
- Permit to export data

Ethical clearance and Free Prior Informed Consent

All LICCI partners need to send the permits required from their field site before the onset of data collection. Requirements vary among countries and depending on the partner's institutional affiliation. Obtaining Free Prior Informed Consent (FPIC) is an essential requisite for collecting LICCI data. There are two main possibilities:

1. Partner's belongs to an institution with ethics committee (i.e., IRB): In this case, the partners should obtain ethical clearance from home institution (e.g., university). The ethical clearance is consistent with the laws and fulfil all requirements of the country in which data collection will be carried out. The partner needs to provide a proof of the ethical clearance (e.g., scanned version). In this case, the partner keeps all the documents related to the FPIC and does not have shown any proofs of the FPIC to the LICCI core team. The partner can use our templates of the FPIC but must adapt it to the individual case (e.g., by changing the name of the responsible person).

2. Partner's belongs to an institution without ethics committee: In such cases, the partner needs to provide a letter from the home institution mentioning the lack of an ethics committee, and the will have to follow the same ethical guidelines than the LICCI core team, as the partner will be under the ethical clearance from the Universitat Autònoma de Barcelona (UAB). In this case, the partner must use our prepared FPIC documents and has to send a scanned copy/photo of each of them to the LICCI core team together

with the data for which they apply (or collect agreement in the tablet). **A dataset will not be considered complete unless the LICCI partner has obtained full consent to collect data.**

LICCI has FPIC templates for representatives (i.e., authorities), villages, and individuals that can be adapted and must be translated to the local language.

INFORMATION SHEET

Local Indicators of Climate Change Impacts

The LICCI project at the Universitat Autònoma de Barcelona, Spain would like to learn about changes you have observed in the local environment and how these changes affect your daily life. For this, we would like to interview you or your community members for a short while and invite you to participate in some meetings. We will use data generated in this study only for research purposes and will not be used for commercial purposes. This study is being conducted with many households in different countries. This research is funded by the European Research Council and the funds are administered by the Universitat Autònoma de Barcelona.

Procedures and duration: LICCI partners will be visiting your area for a certain period of time. The partners will visit you or your community members several times to ask questions about the changes in the environment they have witnessed (e.g., changes in plants, or in animal behavior or abundance, or changes in the soil, the water, and the ice) and how these changes affect them. Each visit may take about one hour. If you or your community members decide to take part in the study, we will also ask you (a) questions on personal details (e.g., age, schooling, work) and changes in the environment you have seen and (b) to participate in community meetings where we will be discussing about changes in the environment. All these methods are widely used by researchers and entail minimal risks.

Data protection: Your personal data will only be available to the project's key personnel and will be completely confidential (i.e., no one will be able to identify you). Any publications or reports will not identify any respondents by name. Data will not be used for any purpose other than scientific publications and conference presentations. We will not allow the data to be used for any commercial purpose. We will always ensure that third parties cannot identify the person who provided data. Aggregated information on local changes in the environment will be uploaded in a web-based platform, so anyone interested can consult it.

Participation: Participation in the research is strictly voluntary, and all the participants are being asked to give their Free, Prior and Informed Consent before the start of the research. You also have the right to withdraw from the research at any time you may wish to without any consequence. There are no individual payments for participating in the study, but we believe that the research project might help empower individuals and villages because this research helps in valuing local knowledge and bringing attention to how indigenous and local people are being affected by climate change impacts.

Benefit-sharing: Information will be used to inform scientists and the public in general about indigenous and local peoples and how their knowledge can help in better understanding of climate change impacts and climate change adaptation/coping. We will also share the information both within and between the different groups participating in the research. The project will help outsiders to gain a better appreciation of indigenous knowledge and observations. At the end of fieldwork, we will share the knowledge gained through this research with participants in a workshop in which we will present our preliminary results.

INFORMED CONSENT FORM (Focus Group Discussion)

We are asking for your participation, because you live in one of the villages selected for our study. You do not have to participate if you do not wish so, and you are welcome to decline to proceed at any time without any consequence. Participation in this study is strictly voluntary. The only alternative to participation is not to participate. There are no penalties to people who decide not to participate, or who started to participate and later decided to withdraw.

During this activity, we will not collect any personal data. Moreover, any publications or reports derived from this study will not identify any individual by name. Data will not be used for any purpose other than scientific publications. The information the group provides on local impacts of climate changes in the environment will be uploaded in a web-based platform, so anyone interested can consult it.

Information will be used to inform scientists and the public in general about which changes your community see in the local environment and how they affect you. At the end of fieldwork, we will carry out a workshop to inform you and all the villagers about our research results. We will invite participants, village leaders, members of local institutions, and municipal government representatives. In the workshop, we will present our preliminary results and ask you whether you think that what we found is accurate.

Victoria Reyes-Garcia is the responsible for the project, and you might as her any questions about the project or the procedures. She might visit the village, but you can always write to her at Institut de Ciència i Tecnologia Ambientals, Universitat Autònoma de Barcelona, 08193 Cerdanyola del Vallès, Spain. You may also call at 00 34 93 581 8976 or send an e-mail to victoria.reyes@uab.cat. If you have questions about your legal rights as a research subject, you may contact: proteccio.dades@uab.cat. To contact her, you should ask the researcher living in the village who will have complete instructions and will do it on your behalf at no cost to you.

By agreeing to participate and giving consent, you are not waiving any of your legal rights, claims, or remedies. You may sign the form yourself or ask for someone else to sign on your behalf.

I have read (or someone has read to me) the information in the consent form. I have had an opportunity to ask questions and all my questions have been answered to my satisfaction. By signing this consent form, I willingly agree to participate in this study.

Name of subject (type or print):

_____ _____

Signature of subject or legal representative Date (must be signed prior to entry)

I have explained the research to the subject and answered all of his/her questions. I believe that he/she understands the information described in this consent form and freely consents to participate.

INFORMED CONSENT FORM (Representatives)

We are asking for your participation because you are a recognized representative of the group selected for our study. We would like to ask you to grant us access to visit the communities of the *[indigenous group name]* and ask them to participate in our study. We will respect your decision and guidance and we will not visit communities that you consider should not be included in this study. Participation in this study is strictly voluntary. The only alternative to participation is not to participate. There are no penalties to people or communities who decide not to participate, or who started to participate and later decided to withdraw.

The personal data we might collect through this project will only be available to the project's key personnel and will be completely confidential, as data will be anonymized. Any publications or reports will not identify participants by name. Data will not be used for any purpose other than scientific publications and conference presentations. Personal data will be kept secret and not used even with research purpose. We will ensure that third parties cannot identify the person who provided data. The aggregated information on local changes in the environment will be uploaded in a web-based platform, so anyone interested can consult it.

Information will be used to inform scientists, policy-makers and the general public about which changes the member of your community see in the local environment and how they affect the people you represent. At the end of fieldwork, we will carry out a workshop to inform you and other local representatives (i.e., village leaders, members of local institutions, and municipal government representatives) of research results. We will present our preliminary results and ask you whether you think that what we found is accurate.

Victoria Reyes-Garcia is the overall responsible for the project and XXXX (Your name). the local responsible. You might ask any of them any questions about the project or the procedures. You can contact them either personally when they are in the villages or at Institut de Ciència i Tecnologia Ambientals, Universitat Autònoma de Barcelona, 08193 Cerdanyola del Vallès, Spain. You may also call at 00 34 93 581 8976 or send an e-mail to Victoria.reyes@uab.cat, or XXXXX (Your e-mail). If you have questions about your legal rights as a research subject, you may contact proteccio.dades@uab.cat. To contact her, you should ask the researcher living in the village who will have complete instructions and will do it on your behalf at no cost to you.

By giving consent for us to visit indigenous villages, you are not waiving any of your legal rights, claims, or remedies. You may sign the form yourself or ask for someone else to sign on your behalf.

I have read (or someone has read to me) the information in the consent form. I have had an opportunity to ask questions and all my questions have been answered to my satisfaction.
By signing this consent form, I willingly give my consent for researchers to visit *[indigenous group]* villages from which I am the legal representative.

Name of subject (type or print):

_____ _____

Signature of subject or legal representative Date (must be signed prior to entry)

I have explained the research to the subject and answered all of his/her questions. I believe that he/she understands the information described in this consent form and freely consents to participate.

Name of LICCI Partner (type or print):_____

Signature of LICCI Partner_____ Date _____

INFORMED CONSENT FORM (Villages)

We would like to visit and do research in your community. We will respect your decision and guidance and we will not visit communities that you consider should not be included in this study. Participation in this study is strictly voluntary. The only alternative to participation is not to participate. There are no penalties to people or communities who decide not to participate, or who started to participate and later decided to withdraw.

The personal data we might collect through this project will only available to the project's key personnel and be completely confidential. Any publications or reports will not identify you by name. Data will not be used for any purpose other than research, which include scientific publications and conference presentations. Data will be anonymized and these anonymized information on local changes in the environment and adaptation/coping strategies will be uploaded to a web-based platform, so anyone interested can access it after agreeing to the terms of the Creative Commons License.

Information will be used to inform scientists and the public in general, including policymakers where accessible, about which changes you see in the local environment and how they affect the people you represent. At the end of fieldwork, we will carry out a workshop to inform you and other local representatives (i.e., village leaders, members of local institutions, and municipal government representatives) of research results. We will present our preliminary results and ask you whether you think that what we found is accurate.

Victoria Reyes-Garcia is the overall responsible for the project and XXXX (Your name). the local responsible. You might ask any of them any questions about the project or the procedures. You can contact them either personally when they are in the villages or at Institut de Ciència i Tecnologia Ambientals, Universitat Autònoma de Barcelona, 08193 Cerdanyola del Vallès, Spain. You may also call at 00 34 93 581 8976 or send an e-mail to Victoria.reyes@uab.cat, or XXXXX (Your e-mail). If you have questions about your legal rights as a research subject, you may contact proteccio.dades@uab.cat. To contact her, you should ask the researcher living in the village who will have complete instructions and will do it on your behalf at no cost to you.

By giving consent for us to visit indigenous villages, you are not waiving any of your legal rights, claims, or remedies. You may sign the form yourself or ask for someone else to sign on your behalf.

I have read (or someone has read to me) the information in the consent form. I have had an opportunity to ask questions and all my questions have been answered to my satisfaction. By signing this consent form, I willingly give my consent for researchers to visit *[indigenous group]* villages from which I am the representative.

Name of subject (type or print):_____

Signature of subject or legal representative: _____

Date (must be signed prior to entry): _____

I have explained the research to the subject and answered all of his/her questions. I believe that he/she understands the information described in this consent form and freely consents to participate.

Name of LICCI Partner (type or print):_____

INFORMED CONSENT FORM (Individual)

We are asking for your participation, because you live in one of the villages selected for our study. You do not have to participate if you do not wish so, and you are welcome to decline to proceed at any time without any consequence. Participation in this study is strictly voluntary. The only alternative to participation is not to participate. There are no penalties to people who decide not to participate, or who started to participate and later decided to withdraw.

The personal data we might collect through this project will only available to the project's key personnel and be completely confidential. Any publications or reports will not identify you by name. Data will not be used for any purpose other than scientific publications. Personal data will not be sold, given, or pass in any other way to third parties that might use it with any other purpose than research. Even in this case, we will ensure that third parties cannot identify the person who provided data. The information on local changes in the environment will be uploaded in a web-based platform, so anyone interested can consult it.

Information will be used to inform scientists and the public in general about which changes you see in the local environment and how they affect you. At the end of fieldwork, we will carry out a workshop to inform you and all the villagers about our research results. We will invite participants, village leaders, members of local institutions, and municipal government representatives. In the workshop, we will present our preliminary results and ask you whether you think that what we found is accurate.

Victoria Reyes-Garcia is the responsible for the project, and you might as her any questions about the project or the procedures. She might visit the village, but you can always write to her at Institut de Ciència i Tecnologia Ambientals, Universitat Autònoma de Barcelona, 08193 Cerdanyola del Vallès, Spain. You may also call at 00 34 93 581 8976 or send an e-mail to Victoria.reyes@uab.cat. If you have questions about your legal rights as a research subject, you may contact: proteccio.dades@uab.cat. To contact her, you should ask the researcher living in the village who will have complete instructions and will do it on your behalf at no cost to you.

By agreeing to participate and giving consent, you are not waiving any of your legal rights, claims, or remedies. You may sign the form yourself or ask for someone else to sign on your behalf.

I have read (or someone has read to me) the information in the consent form. I have had an opportunity to ask questions and all my questions have been answered to my satisfaction. By signing this consent form, I willingly agree to participate in this study.

Name of subject (type or print): _____

Signature of subject or legal representative Date (must be signed prior to entry) _____

I have explained the research to the subject and answered all of his/her questions. I believe that he/she understands the information described in this consent form and freely consents to participate.

Name of LICCI Partner (type or print): _____

Signature of LICCI Partner Date _____

INFORMED CONSENT SCRIPT

Thanks for agreeing to talk with me. As I mentioned before, I am working in the LICCI project at the Universitat Autònoma de Barcelona, in Spain. We are doing a research about changes you have observed in the local environment (e.g., changes you have seen in plants, animals, soil, water, ice) and how these changes affect your daily life. I would like to ask you some questions about these topics.
There are no risks involved in this interview and your participation in this interview or any other part of the study is completely voluntary. If you do not want to answer a question, please let me know and we will move on to another. If at any time you decide you do not want your information included in the study, you can let us know at the end of the interview or by contacting us later via e-mail, letter, or phone at the contact information we are providing you. You can also obtain our contact information from the village representative. Your answers will be anonymized, identity will be protected, and no one will be able to see which specific information you have provided for this study. After we have completed the research, we will present the results of our findings at conferences and publish articles in scientific journals. The data you provide will be combined with data from other field sites and will be made public on an internet platform. At the end of the research period, we will also conduct a workshop in the community to present to you our main results. Do you have any questions that you would like to ask about the study or about your participation in it?

Researcher Contact information:
Victoria Reyes-García
Institut de Ciència i Tecnologia Ambientals,
Universitat Autònoma de Barcelona,
08193 Cerdanyola del Vallès, Spain.
Tel: 00 34 93 581 8976
Email: Victoria.reyes@uab.cat.

Ethics committee Contact Information
Comissió d'Ètica en l'Experimentació Animal i Humana (CEEAH)
Edifici A - Campus de la UAB
08193 Bellaterra (Cerdanyola del Vallès)
Barcelona Spain
Tel.: 34 – 93 581 35 78
Email: proteccio.dades.@uab.cat

ORAL CONSENT CARD

NOTE: The oral consent card may be used for illiterate respondents and/or respondents who are not comfortable in signing a document. The LICCI partner is expected to be aware of these country- and context-specific considerations and can decide when to use the oral consent card BUT a witness (e.g. translator) should sign in behalf of the illiterate respondent

MAKE SURE THAT

People understand they are taking part in a research. They understand what you are asking of them, and they freely consent to participate. You have their permission to use the information you gather about them in the ways you intend, including scientific publications and conference presentations.

People understand what kinds of information you are collecting and that you are not carrying away any material from your interactions with them.

People know that you are collecting personal identifying information about them and that you will keep their identity confidential.

People understand the risks they incur in participating on your research and what you are doing to minimize them.

People know what are the particular benefits that participating in the research brings to them.

People know they can opt out of the study at any time, and that they can request that any materials implicating them be destroyed. They know they are free to refuse answering any of the questions asked.

People know they can ask if they have any questions or concerns about research. You should provide them with your contact information and the contact information of the Ethics Committee at UAB.

Name of subject (type or print): Signature of witness _____

Date (must be signed prior to entry) _____

I have explained the research to the subject and answered all of his/her questions. I believe that he/she understands the information described in this consent form and freely consents to participate.

Name of LICCI Partner (type or print):_____

Signature of LICCI Partner _____ Date_____

Community engagement protocol

We aim to ensure that LICCI will have a fair benefit sharing mechanism with the indigenous and local community participants. These can be done through simple activities such as workshops with participants and local leaders and dissemination of information to increase awareness at the national and international levels about IPLC issues. Here, we provide the two main pathways for the fair sharing of the benefits of this research.

(1) Initial meeting. During the initial meeting with a community the LICCI partner should facilitate the elaboration of an agreement on a feasible and ethical "Community/Indigenous Engagement Protocol". The LICCI partner should discuss with village members and/or representatives' ways in which the research can bring benefits to local communities, which can be in the form of capacity building, knowledge sharing, documentation, etc. The outcomes of this discussion should be written down in a document that we are calling "Community/Indigenous Engagement protocol." The elaboration of such protocol implies a certain degree of accountability of LICCI partners to the indigenous and local communities. This may also build local capacity in negotiating the terms of other potential future research in the area and contribute to producing material that features the research results to be shared with the communities. Examples of these materials include booklets, fliers, radio programs, or calendars.

(2) Information exchange. At the end of the stay in the villages, LICCI partners participating in the project should carry out a workshop oriented to share and discuss research results with participants. This second workshop should be conducted as a dialogue of different types of knowledge, where information on local indicators of climate change is presented at the same level than scientific information (see Tengö et al., 2014). Disseminating results among villagers is a way of thanking them for their participation in the research and sharing any potential benefit associated to knowledge generation.

Here listed other ideas in which you can involve people in the research or communicate research results:

- WhatsApp group to disseminate information of research outputs;
- Bring IPLC to conferences where you are presenting so they can present from their own perspective;
- Include your research assistant/translator as co-author in publications.
- Use some non-academic ways to disseminate information, e.g., Terralingua magazine.

On Coding and Codes

Getting uniform coding is extremely important for the quality of data. In the LICCI project, we will be working with both common (shared) codes, as well as site-specific codes.

The codes are used in order to identify objects (villages, products, persons) and values for fields in protocols, where the answer is indicated from a set of possible answers. While using the app for data collection drastically simplifies this process, it is important to understand the format that is required for all components of data collection (Site/Village Cards, SSI, FGD and Survey) in case the app is not available.

The **Output Manual and Deliverables tables** contains all parts of data collection separated in corresponding sections, ready to be printed out as many times as required. These documents have a uniform structure for most parts, with columns describing the variable names, questions and **Response Format** (defining how a given data needs to be coded).

General considerations on coding

- All fields need to be fill out, only in some cases some questions are conditioned. That means it can be ignored depending on the response of a previous question. But always marked with a code for "not applicable" (-).
- Every data sheet must have a notes section where the researcher can record non-coded items and explanations for any entry that differs from the format
- Anything lacking a common code should be sent to the core team at UAB, which will assign a new code.

Common codes

All submitted data has a set of common codes (if you are using the app, you won't need most of these codes):

- **InvestigatorID**: Incremental number. New InvestigatorIDs are assigned incrementally within a group (we provide this)
- **Countrycode:** For countries we use the ISO 3166-1 alpha-2 codes, which are two-letter country codes (for example Spain: ES, Brazil: BR, Namibia: NA)
- **SiteID:** A code for the site of the IPLC providing information. Site IDs are assigned incremental within a country. Normally, Site ID will be the same as Investigator ID (unless you do more than one site, in which case you need to tell us).
- **VillageID**: Incremental number within a site (assigned by the investigator if not using the app)
- **FGDID:** Incremental number within a site (assigned by the investigator if not using the app)
- **ChangeObservationID:** Incremental number within a site (assigned by the investigator if not using the app)
- **HouseholdID**: Incremental number within a village (assigned by the investigator if not using the app)
- **SubjectID**: incremental number within a household (assigned by the investigator if not using the app)
- **Date:** *Notation of the sample date in the format:* **dd/mm/yyyy** where:

dd: Day of the month as a zero-padded decimal number. *01, 02, …, 31*
mm: Month as a zero-padded decimal number. *01, 02, …, 12*
yyyy: Year as a zero-padded decimal number. 1980, ..., 2025

- **Protocol ID:** All protocols have an ID, which consists of two parts:
  - Title: The title, that identifies the Protocol
  - Version: An incremental number, that specifies the version of the protocol

Response format

These are the response formats that you will encounter in the protocols and the explanation on how to interpret them:

- **Text:** The response of the question is a free text, without a particular code.
- **Number:** a free number input (integer)
- **Non.Neg. number:** a number input, where the number must be 0 or more
- **Pos. number:** A number input, where the number must be 1 or more
- **Number: min: <x>; max: <y>; description:** a number between min and max, e.g., number, min: 1, max: 5
- **number: unit <unitname>:** a number of a specific unit, e.g. number: unit $
- **list:text:** arbitrary number of free text inputs (comma separated), e.g. tiger, lion, giraffe, eagle
- **list:number:** arbitrary number of number inputs, e.g. 4,6,10
- **select: <codename>: option1, option2, … (other):** one of the given options. if other variables use the same response format "select: <codename>" is sufficient after the first appearance of the options, e.g. select: gender: male, female. If “other” is specified, use text entry.
- **select multiple: <codename>: option1, ...:** multiple of the given options. if other variables use the same response format "select multiple: <codename>" is sufficient after the first appearance of the options

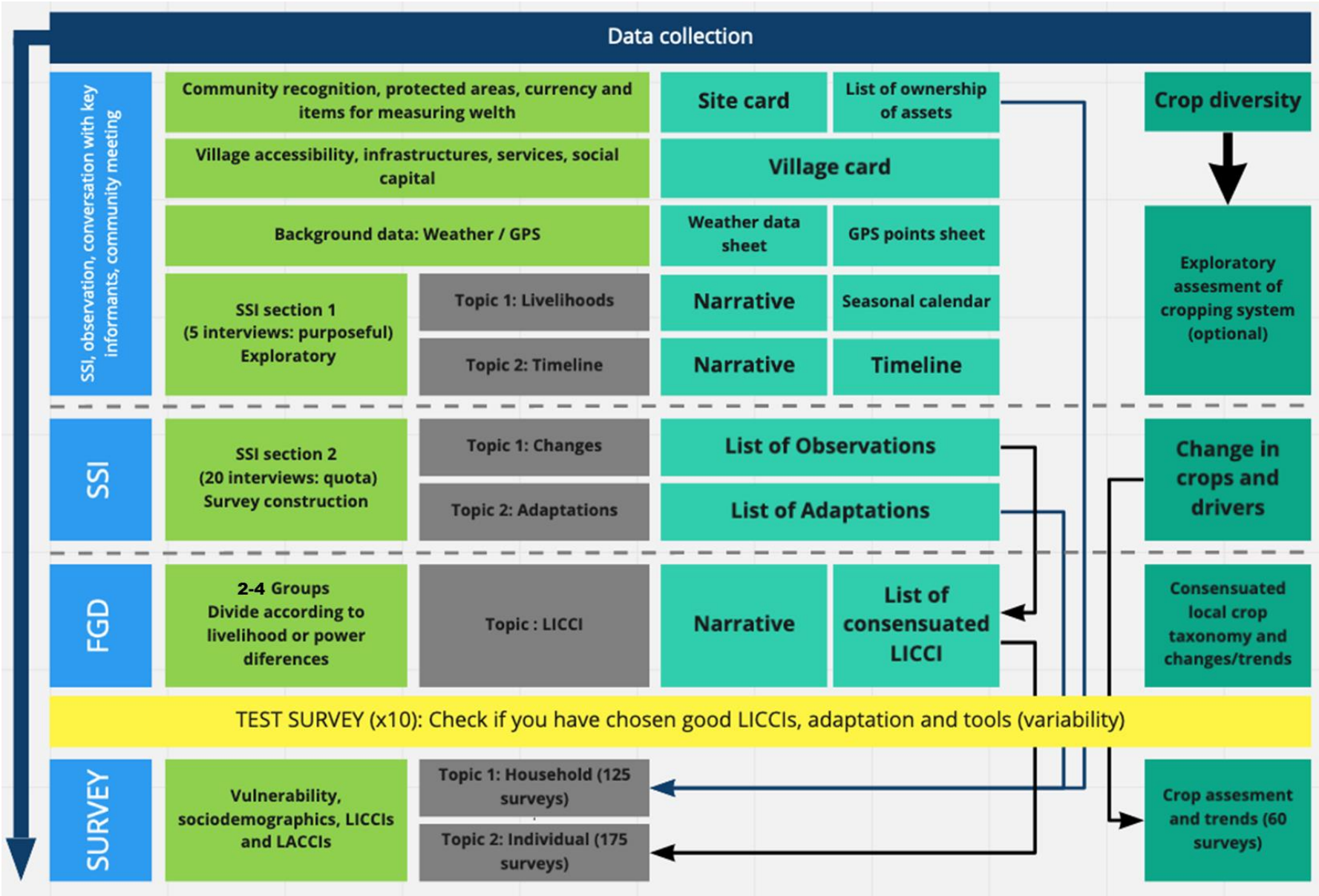
In general, we also code **Not applicable** as a - (cross out the answer field) and **Doesn’t know / doesn’t want to tell** as NA.

Data collection overview

In general, the LICCI data collection consists of three major parts: 1) the collection of background data, including weather station and GPS data, site information, and village cards; 2) the collection of qualitative data, including semi-structured interviews, and focus group discussion, 3) the collection of quantitative data, including household surveys and individual surveys. The following is only a brief description of the data collection procedure, please find detailed information in corresponding sections in this manual.

1) Most of the *background data* could be obtained before conducting fieldwork, among which, weather station data should be collected beforehand (before conducting fieldwork) and following the criteria to locate the most accurate data source(s). GPS data must be collected while in the field. Site information and village card could be collected through various ways, including secondary data (i.e. literature review, public records, etc.), conversation with local officials/knowledgeable individuals, etc., and participant observations.
2) *Qualitative data* collection is a two-stage process. Firstly, partners need to conduct appx. 25 semi-structured interviews to get information about community timeline, seasonal calendar, observed changes and corresponding drivers, as well as adaptation/coping measures. Secondly, take the information obtained from SSI to the focus group discussions for validating, the observed changes and corresponding drivers will be validated, and new observed changes will be identified through FGD.
3) *Quantitative data* collection consists of two levels of surveys: (1) household-level surveys, for which 125 households will be randomly selected and, (2) individual-level surveys, for which 175 individuals will be selected following convenience sampling.

Below attached is the graphic overview of data collection process including the methods and expected outputs, as well as the interlinks among different methods.


Data collection
SSI, observation, conversation with key informants, community meeting
Community recognition, protected areas, currency and items for measuring welth
Site card
List of ownership of assets
Crop diversity
Village accessibility, infrastructures, services, social capital
Village card
Background data: Weather / GPS
Weather data sheet
GPS points sheet
Exploratory assesment of cropping system (optional)
SSI section 1 (5 interviews: purposeful) Exploratory
Topic 1: Livelihoods
Narrative
Seasonal calendar
Topic 2: Timeline
Narrative
Timeline
SSI
SSI section 2 (20 interviews: quota) Survey construction
Topic 1: Changes
List of Observations
Change in crops and drivers
Topic 2: Adaptations
List of Adaptations
FGD
2-4 Groups Divide according to livelihood or power diferences
Topic : LICCI
Narrative
List of consensuated LICCI
Consensuated local crop taxonomy and changes/trends
TEST SURVEY (x10): Check if you have chosen good LICCIs, adaptation and tools (variability)
SURVEY
Vulnerability, sociodemographics, LICCIs and LACCIs
Topic 1: Household (125 surveys)
Topic 2: Individual (175 surveys)
Crop assesment and trends (60 surveys)

Sampling considerations

Site selection

LICCI core team is responsible for site selection. Data will be collected in about 50 different sites with Indigenous Peoples and Local Communities (IPLC) residing in different climate types. The approx. 45 external partners (i.e. PhD candidates, scholars, and practitioners, etc.), who have previous experience working with IPLC and have an established field site, will be the primary contributors of the LICCI data collection. Partners and the core team will work in sites where IPLC are directly dependent on natural resources for their livelihoods and have long-term and intimate interactions with the local environment. Criteria taken into consideration when selecting study sites as following:

1. *Site data availability*. We give priority to areas where: (a) instrumental data is deficient; (b) no or few studies of local indicators of climate change have been conducted.
2. *Climate type*. We select study sites that are proportionally distributed across the five different climate-types defined by Köppen-Geiger (i.e. tropical, arid, temperate, continental, polar and alpine) (Peel et al., 2007).
3. *Predominant economic activity*. We selected sites that are proportionally distributed across societies whose subsistence mainly depends on agriculture, hunting-gathering, fishing, and animal husbandry/pastoralism.

Village selection

The LICCI partners are responsible for the village selection within their own study site under the support of LICCI core team. Selection will be discussed during the "sampling" session of the training workshop at ICTA-UAB. The text below serves as a guideline, exceptional cases will be discussed during the training workshop.

In each site, data will be ideally collected in 3-5 villages, regardless of distance between villages. We define a village as the lowest administrative unit in an area, normally under the jurisdiction of a village leader/council. Selected villages should be (i) relatively homogeneous, and (ii) representative of the environmental and socio-cultural conditions of the site. This means partners should try to avoid special cases (e.g., areas with unusual favorable or unfavorable conditions, with high donor intervention, etc.). To reduce complexity in logistics, in principle the project is to target villages of size between 20 and 500 households. For villages with more than 500-1000 households, one should consider breaking it up into smaller units and sample one or a few of them.

The number of villages selected in a site will vary case by case. However, it is crucial to take the following into consideration: the size of the villages selected, necessary permits for conducting research, and time availability, academic interest, and personal network of the partners.

Background data

Weather station data

Goal: To analyze trends in long-term changes in climate parameters

Sampling: This information should be collected at the site level. Most of the study sites will be in remote areas, however, partners are encouraged to find out the location of the closest meteorological station(s) with data that fulfil the criteria listed below. → '**get the best you can**'

Tip: Airport is often a good option to get weather data.

For each site, we expect the following climate data from at least one weather station:

1. Data on temperature and precipitation, at least on monthly resolution (optional: wind, solar radiation, air moisture);
2. Data from weather stations within 100 km from the site and a complete time series of at least 30 years;
3. If #2 is not feasible, then data from weather stations within 100 km but for a time series of at least 20 years and/or data from a weather station within 200 km and at least 30 years;
4. If #3 is not feasible, then data from a weather station within 200 km and for at least 20 years.
5. If none of the above is possible, please get in touch with the LICCI core team.

Spatial weather and climate variabilities are very site-specific and depending upon the topography of a field study. If there are sources of data that match differently with the above criteria, please follow the rule of thumb: *time period >distance to the study site>data resolution (daily vs. monthly).* It is also very important that time series do not contain too many gaps (i.e., a few missing years during 20 to 30 years is acceptable).

Required weather data: The required and optional weather data are listed in Table 3.

List of required data from weather stations

Type of data	Parameter	Specification
Time series characteristic	time period completeness temporal resolution	time interval (at least since 2000) no (or very few) missing data best daily, otherwise monthly
Weather station location	GPS position [WGS 84, decimal degree] Altitude [masl]	longitude, latitude elevation
Mandatory climate parameters	Temperature [°C] Precipitation [mm]	min., max., mean total
Optional climate parameters	Precipitation intensity [mm/h] Wind [m/s] Solar radiation [kJ/(m²*day)] air moisture [%]	max., min., mean min., max., mean mean, (max., min.) mean, (max., min.)

Expected output: Time series (at least for the last 20 years) of climate data (at least of temperature and precipitation, at least at monthly resolution) for nearest weather station (at least within a radius of 200 km of the site). First, please complete the questionnaire on weather/climate data beforehand to inform the LICCI core team about availability of weather data and send it to the LICCI core team if accessible. If weather data is available, please fill in the provided template documents *weatherData_partnerID_siteID.xlsx* or *weatherData_partnerID_siteID.ods* (you can find them on the LICCI webpage under the member section) with your climate data and adapt the names by replacing the acronyms by the respective codes. Keep in mind to send the template to the LICCI core team by uploading it onto your personal account in the LICCI data repository (currently: ProjectSend). Please also upload the raw data derived from the weather station(s).

GPS data

Goal: To provide geographical information and specific georeferenced locations (GPS waypoints and areas) of the site and the villages (e.g., closest market town)

Description: Partner should obtain spatial information that allows to position the field site and other locations of interest. Particularly, we are looking for

- Spatial information of the site (representative area [Site GPS representative area]);
- Spatial information of GPS position of the weather station(s) from which weather data are obtained [Site GPS weather station] and GPS position of the closest airport(s) [Site GPS airport] and port(s) [Site GPS port];
- Spatial information of protected areas within the study site or close by (e.g., national parks) [Site GPS protected area] (see table below);
- Spatial information of the villages (center [Village GPS center], road access [Village GPS road] and area [Village GPS area]);
- Spatial information of the officially recognized territory where villages in the selected site are located (or neighboring) [Village GPS IPLC];
- GPS position of the closest market town [Village GPS market town] and closest administrative center to each village [Village GPS administrative center].

Sampling of geographic information: If spatial data of protected areas and officially recognized territories of the IPLC are openly accessible on the internet (e.g., shapefiles), please provide us with the URL. If no georeferenced information is available, please use the OfflineMaps App (or ArcGIS/QGIS) to record GPS data.

Sample all points and areas in the lists below. For each waypoint, measure the geographic latitude [WGS84, decimal degree], the geographic longitude [WGS84, decimal degree] and the altitude [masl]. For each area, draw an area. We recommend using the OfflineMaps App on the tablet that was provided by the LICCI project for GPS data collection, storage and transfer to the LICCI core team. However, feel free to use your personal GPS device, and/or ArcGIS/QGIS (to draw areas), and/or other sources to get the GPS positions and elevations for waypoints (e.g., Google Maps).

Important when using the OfflineMaps App: Remember to set the coordinate system to WGS84, decimal degree! If you use the OfflineMaps App to get the GPS positions (including

elevation) you must be physically at the location of interest to obtain the elevation data (e.g., for village, town, city). Otherwise the OfflineMaps App will not record the elevation.

GPS data storage in the OfflineMaps App: OfflineMaps App: Store the GPS data on the OfflineMaps App. Create a main folder with the name PartnerID_SiteID. In the site folder, store the site-specific GPS data. Create sub-folder for each village with the names PartnerID_SiteID_VillageID. In each sub-folder store the village specific GPS data. Name each item according to the following coding: PartnerID_SiteID_variable for site GPS data and PartnerID_SiteID_VillageID_variable for village GPS data. It is very important that the file name contains the variable names! As soon as you have internet access upload the data to the LICCI data repository.

GPS waypoints and areas of study site

PartnerID:		SiteID:	Date:	
Variable	**Description**	**X Longitude [WGS84 decimal degree]**	**Y Latitude [WGS84 decimal degree]**	**Elevation [masl]**
Site GPS weather station* [waypoint]	Position of nearest weather station(s) from which weather data are obtained.			
Site GPS airport* [waypoint]	Point of closest airport(s) (see definitions)			
Site GPS port* [waypoint]	Point of closest port(s) (see definitions)			
Site GPS representative area [area]	Area of the region that represents the study site.	----------		
Site GPS protected area* [area]	Area of protected natural areas within or close to the study site (e.g., national parks) (see definitions)	----------		
Site GPS official IPLC's territory* [area]	Area of the officially recognized indigenous territory (see definitions)	----------		

** Notes: If more than one object belongs to the above categories (i.e., more weather stations from which data were derived, more than one airport, port, or protected area), please attach a number at the end of the variable, (e.g., Sgpsairport1, Sgpsairport2,…). Important: For the same weather station or protected area always use the same number (e.g., for the information in the Village Card and the table for weather data) to avoid confusion.*

GPS waypoints and areas of the villages

PartnerID:	SiteID:	VillageID:	Date:	
Variable	**Description**	**X Longitude [WGS84**	**Y Latitude [WGS84 decimal degree]**	**Elevation [masl]**

		decimal degree]		
Village GPS center [waypoint]	Village central location (e.g., school, church, community building)			
Village GPS road [waypoint]	Point of entrance to the main road (see definitions)			
Village GPS market town [waypoint]	Central point of the closest market town (see definitions)			
Village GPS administrative center [waypoint]	Central point of the administrative center for the village (see definitions)			
Village GPS area [area]	Area of the village (settlement)	----------		

Expected outputs: GPS data (waypoints and areas): longitude [WGS84, decimal degree], latitude [WGS84, decimal degree], elevation [m]) for each waypoint of interest and georeferenced areas for each area of interest as indicated in the tables above, by either using the OfflineMaps App or other accepted formats. You will find the description on how to use the OfflineMaps App and how to upload the data to the LICCI data repository in the Technical Manual. Other accepted formats for GPS data are the prepared templates *GPSdata_waypoints_partnerID.xlsx* or *GPSdata_waypoints_partnerID.ods* for points (you can find them on the LICCI webpage), .gpx files from GPS devices, and GIS features (e.g., shapefiles for areas). In the latter cases, please use the same coding for naming as described above in the section *GPS data storage in the OfflineMaps App.* Upload the data onto your personal account in the LICCI data repository (currently: ProjectSend).

Information about the OfflineMaps App: For further information on how to use the OfflineMaps App visit the OfflineMaps webpage (https://www.offline-maps.net), read the LICCI Technical Manual and check the LICCI video tutorials which you can find on the LICCI webpage (currently under the member section which requires the user to be logged in).

Site information

Goal: To collect general information about the site context, such as its location, the name of the community under study, the presence of protected areas and standard prices of basic household goods.

Sampling: Only one card is required for each site, which should provide a general overview of all the villages selected within the study site. The information should be obtained through secondary data sources available (e.g., published literature, reports, etc.) and can be complemented using direct data collection (e.g., direct observation, interviews).

Protocol: The site card could be filled at different moments; the general data can be filled before starting the fieldwork based on the availability of secondary data from official sources

and literature review. However, the value of assets needs to be completed upon finishing the semi-structured interviews or through participant observations. Partners will use the web www.oanda.com as factor conversion of the local currency and will record the day when they have checked the conversion value. Partners are responsible to check the value of local currency before starting fieldwork. Partners must include all protected areas present in their field site and be specific about each one if multiple statuses of protection are involved. Do not include them if the protected area does not affect any of the villages of your site (e.g., the villages are not inside the protected area). If any protected area has changed its protection status, and both status are active (e.g., changing from State Park to National Park, but both statues are being recognized), add them separately as different protected areas. Partners will need to identify each "Protected Area" and "Recognized Territory" with an ID.

Expected output: Partners should only complete one Site Card representing their study site (check ***Output Manual***). (The short narrative included in this section in the previous version has been merged with the short narrative of the SSI Section 1 – Timeline).

Ownership of assets with a market value

Goal: To create a list of assets with monetary value to analyze differences in ownership of these assets within the study site. Also to include a list of livestock species used by the community with monetary value.

Protocol: Create a list of assets with market value. You can obtain this information from the SSI, participant observations, and informal interviews with the local translators and key informants. Prices can be obtained from local markets, shops and/or vendors. Try to obtain prices for the 'average' item and livestock species (e.g., do not ask for the price of the newest models/most expensive breed). The list of assets includes products purchased in the market (indicating household's ability to buy items) and self-made items with substantial market/retail value. The list should include livelihood related items (i.e., tools, transport) and household items (i.e., cookware, appliances) which are typically purchased. Make sure to include 5 items that are expensive/exclusive, 5 items that most people have but not everyone, and 5 items that are particularly common. Also include assets owned mostly by men and assets owned mostly by women.

Main livestock species: The list of livestock species should include the main species used by the community. It is expected to include species used as transport tools (e.g. horses and camels), as farming tools (e.g. oxen, elephants, etc.), and as sources of food (e.g. sheep, goats, cows, etc.).

Expected output: We are aiming to obtain a list (check ***Output Manual***) of assets and livestock species that are relevant for determining a household's ownership of assets with a market value (to be used later in the survey after testing variability).

Village Information

Goal: To collect general information about village's characteristics such as the number of households; whether the village is located within a protected area or an officially recognized territory infrastructure; access to services and social capital of the communities.

Sampling: The information about the village's attributes can be obtained from a variety of sources, depending on the local context and the specific question. The most common sources of information include:

1. Observation/self-measurement: Some information can be obtained from personal observation, e.g., "is there any radio / TV in the village?".
2. Secondary data: Some villages may have good records of population, access to public services, organized social groups, etc. To calculate the number of households per village, partners can also use *aerial photos* or *draw their own map* if the distribution of households is very dispersed along the study site.
3. Village officials: In cases where reliable written records are not available, village officials may have some of the information needed. Warning: do not rely (solely) on village officials for collecting village information, as they may be biased or 'polished'.
4. Key informants: In most villages you can find people who have a good overview of the situation and thus could be a key informant. Moreover, it is vital to crosscheck the information obtained since there might be a degree of subjectivity and uncertainty.

Protocol: Fill in the village card at the beginning of your work in the village, when you establish contacts with village representatives to explain the project. Update the card as needed through the duration of data collection.

On village accessibility: The goal is to measure the village accessibility from the market town and the administrative center, considering different ways of transport, seasonality, as well as costs and the duration of the travel. "Easy" and "hard" seasons correspond to the periods of the year when it is respectively easier and harder to access the village (for example, due to seasonal rainfall). For each season (easy and hard), indicate whether the village is accessible or not, how long does it take, how much does it cost, the means of transport used (it can be a combination of several) and the frequency to do this travel (weekly, daily, etc.); all this information should be obtained considering the most common way to reach the village. If there are alternative ways to reach the village (e.g., most people access the village by boat, but there is also another way to get there by motorbike), also obtain all the information for alternative ways of transport. In some cases, administrative center and market town are the same, and there are no differences between easy and hard seasons, so you do not need to fill all sections separately.

On village social capital data: This is to capture the social capital of each village and to know the degree of cooperation among its members. The questions should be scored from 1 to 5, being 1 the minimum score and 5 the maximum. In this section, the categories of the answers are not defined because we consider the scale will be very context specific. The 1-5 scale does not need to be directly presented to the interviewee but instead it should be used as a guideline for researchers to code the answers that might be purely qualitative/textual. "Formal groups" refers to a group of people following formal relationships, rules, and policies established for compliance, and there exists a system of authority.

Expected outputs: We are aiming to obtain one village card per village where data are collected (i.e., 3-5 village cards per site), with the following sections:

1. General village data
2. Village accessibility data
3. Village infrastructure data
4. Village services data
5. Village social capital data

Check ***Output manual*** for details on each card.

Semi-structured interviews

Goal: To obtain an initial assessment of the field site in order to get in-depth understandings of the local context, and particularly of 1) local livelihoods and dependence on the natural environment, 2) time-line of events that are important to the community, 3) perceived changes in the environment and the corresponding drivers, and 4) adaptation/coping measures. Moreover, these assessments should help identify the most appropriate wording for survey questions and would provide essential outputs to build the survey questionnaire.

Before the semi-structured interviews, make sure you have clarified a "glossary" with the interview terminology. Run 3-5 pilot interviews to check how the concepts work in the local context and train the translator(s)/assistance(s). Pay attention to tricky concepts such as 'environment', 'activity', 'livelihood', 'adaptation/coping', 'change', and 'calendar' etc.

The semi-structured interviews are divided into two sections, each comes with different sampling criteria, therefore the two sections should be conducted separately. We provide a set of topics to be covered in these two sections, but it is up to the partners in terms of how to organize the format and the order of interview questions.

**Note: The selection of individuals is the responsibility of the individual partner with the support from the LICCI Core Team. Take advantage of the "sampling" session in the training workshop at ICTA, UAB to discuss any doubts or concerns.*

Section 1: Local livelihoods, local timeline events, and seasonal calendar

Sampling **(site-level)**: To select informants for these interviews we will follow "judgmental or convenience sampling". The aim is to interview the most knowledgeable people who can inform about local livelihoods and local timeline events (local experts). Specifically, we will target people who has lived in the site for a long time (at least 30 years). This information will be gathered at the site level, sampling 3 to 5 interviewees per site. Try to at least include one interviewee per village, depending on the number of selected villages and saturation of information (i.e., when the following interview does not add much information to the topics). Please note that if you already have this information, it is not necessary to collect it again.

Protocol: Semi-structured interviews should be organized around the two topics below. Note that not all the questions have to be answered by all the interviewees. If you have been working in the area previously, you can also include the information collected before, but make sure all the points below are covered.

1. ***Local livelihoods***
    a. *Explore the activities people do for a living in this community. It can be main activities or seasonal activities.* The intention here is to obtain an overview picture of the livelihood activities people in the site do both for subsistence and for income (e.g., hunting, fishing, agriculture, etc.). Include activities that are not related to natural resource management (e.g., wage labor, etc.) and make sure to capture the information about if they consume or sell the products.

b. *Explore the timing when those activities take place (yearly, seasonally).* We are aiming to obtain the seasonality for each main livelihood activity. The best way of obtaining this information is through a ***seasonal calendar*** with each activity (e.g., regarding agriculture, we should know when planting / harvest occurs, naming of the seasons, criteria for defining when a season starts and ends, etc.), and marking dates of important events (e.g., seasonal festivities) particularly those related to resource management.

c. *Explore the location where those activities take place.* We are aiming to understand where the activities take place in terms of land/water tenure rights. Explore if people use private, communal, state land, or a mix of the above-mentioned. If the village/site is in a protected area, explore where people can access resources (even if they do not have ownership of the land).

d. *Explore the household members or community groups in charge of those activities.* The idea is to understand the labor division across gender, age, and other social groups related to the activities mentioned in previous questions.

e. *Explore variation of ILK regarding livelihood activities within the society.* For example, some groups have specific names for expert hunters or fishers, and some other groups mention that ancestors have higher level of knowledge. Remember we are asking about variation in ILK related to their livelihood activities (not expert or sacred knowledge), a domain of knowledge that should be familiar –to some extend- to most people. If division of labor is gendered, make sure you ask about men's and women's activities. Thus, during interviews on livelihood strategies, you should ask something like "Are there people/group of people who have more knowledge about [activity]?" or "How do you know if someone is very knowledgeable about [activity]?" Ask this question regarding all livelihood activities common in your area and note who are the people locally considered knowledgeable (e.g., elders, ancestors, village chief etc.). Specifically, we need to know who is more knowledgeable about the usage of wild plants.

2. Local timeline

a. *Explore the history of the study site.* We want to capture the temporal dimension about the local history of the villages in that site. Relevant information including: when the community was founded/established (try to avoid getting into mythological stories and ask the question in a way that allows you to determine if the village has a long-term history or if it is the result of displacement or migration); demographic changes, migration and habitation patterns; land-rights over their territory and its evolution along the time, trends in interaction with markets or changes in livelihood activities; and approximate dates/time periods when these events/trends started to happen. Also, try to include extreme weather events. As many people might not remember dates, one way to get this type of information is by referring these events through a person's life events.

b. *Explore important events in the community that everyone remembers.* These should help us create a ***common site timeline*** spanning about 80-100 years. The timeline might include 1) memorable climatical events (e.g. floods, droughts, fires, earthquakes, and hurricanes, etc.); b) social 'markers' (e.g., death / birth

of residents, construction of buildings, parties / celebrations / rituals); c) other important events (e.g., football, arrival of electricity, road building, etc.)

c. *Explore when these events happened.* Date as precisely as possible the events mentioned above.

Use a visual timeline that could be validated together with the interviewees and possibly brought to the focus group discussion (FGD) as a conversation starter. Note that the timeline is ***NOT meant to be built at the FGD, but rather be built as a compilation of the individual interviews and perhaps a group interview with elders or a community meeting.*** Use 20-year periods based on lifelines (childhood, adulthood, seniority) and/or linked to personal life events (school, marriage, first child, first grandchild) if you know the birth year of the respondent.

Expected outputs: Partners should keep raw data (i.e., transcripts, recordings of the interviews, and field notes, etc.). Partners SHOULD NOT submit raw data, although part of it might be required for clarifications. Partners should produce and submit the following documents summarizing results from all interviews (outputs are collective, not individual):

1. ***A short narrative*** (approx. 1 page per topic) summarizing the main issues learned from each topic above (local livelihoods and timeline) for the study site. This narrative should also include a description of the sample and interview procedure (i.e., description of when the interviews took place -season/calendar, number of people interviewed, age, gender, etc.) and a short description of the ecological characteristics of the site. This information would help with the interpretation of information.
2. ***The yearly seasonal calendar.*** During fieldwork, partners are recommended and encouraged to use creative tools such as drawing as an approach. The calendar can be circular or linear, and structured by season or by month, whichever fits better the local worldview. However, we expect partners to deliver this data in a structured way via the app or the excel tables (csv). It is important to note before entering this data, make sure you read and follow the following definitions:

   Season: refers to a period of time during the year (at least 1 month) with certain climatic and only climatic characteristic(s). For example, if in the field people talk about "cherry season", it is not considered a season in LICCI data collection, but an activity which is organized around a climatic season (e.g., spring season, warm season, dry season).

   Event/Activity series: refer to a series of events or activities that have similar attributes related to a theme that repeats every year. For example, “cherry growing” or “The behavior of the monkeys”.

   - *Activity-series*= “Cherry growing” (related to human activity).
   - *Event-series*= “The behavior of the monkeys” (independent of human activity).

   Events/Activities: these are all activities or events that make up the series. Following the examples mentioned above, all activities related to a thematic series follow a logical sequence.

   - “Cherry growing” ***Activity*** = seedling, maintenance, fruit harvesting, fruit processing in marmalade ...

- "The behavior of the monkeys" ***Events***= migration, breeding period, birth period ...

To conclude, each *Season, Event/Activity series,* and *Events/Activities* has a local name, a short description, a beginning and an end. Here is what you need to enter as data:

- Season: local name: 'Summer'; description: …; May-September.
- Event/Activity-series: name 'Cherry growing'; description…; November-September
- Events/Activities: name 'fruit harvesting'; description; June-August

**Important note: events and/or activities collected with the seasonal calendar must all be dependent or linked to the climatic seasons.*

3. ***The site timeline*** spanning the last 80-100 years. During fieldwork, partners are recommended and encouraged to use creative tool such as drawing to obtain this information. However, we expect partners to deliver this data in a structured way via the app or the excel tables (csv).

   The timeline is built in the format of a series of events. Each event should include the title, the description, the type (i.e., climatic, cultural, political, etc.), and the date (approximate date is acceptable).

**Note: calendar and timeline can be also constructed in a community meeting or a group interview with elders if deemed more efficient. Examples of calendar and timeline outputs will be given in the training session at ICTA-UAB.*

Section 2: Perceived changes, drivers of changes, and adaptation/coping measures

Sampling **(site-level)**: For this part of the semi-structured interviews we will use "quota sampling". We acknowledge that different people will have different knowledge and perceptions of local indicators of climate change impacts (LICCIs), therefore, we aim to capture the diversity of knowledge within the site. Specifically, we create a grid/table of categories of interest (gender, age, livelihood) and try to fill it with informants (e.g., a man and a woman; a young, a middle aged and an elder; a fisher, a hunter, a farmer, and a trader). This information will be gathered at the site level, sampling 15 to 20 interviewees, minimum 3 interviews per quota. To select people within each quota, partners should rely either on key-informants or on snow-ball sampling. Note that we will use local age categories (no fixed age limit but what the locals consider as young, middle aged, and old).

		Fisher	Farmer	Hunter-gatherer	Pastoralist	Others	TOTAL (minimum)
Young	Men						3
	Women						3
Old	Men						3
	Women						3
TOTAL (minimum)		3	3	3	3	3	

Protocol: This section includes two main topics: Changes and adaptation/coping measures. However, the flow of the interview should be guided by each change observed/perceived: lead conversation about changes in the environment until the interviewee describes an observation/perception of change. Upon describing, note it and guide the conversation towards what they think is driving/causing that change (try to aim at the maximum possible levels in the LICCI tree https://licci.eu/ressources/licci-classes/index.html. and how this change affects them - what they do to confront/adapt to/cope with it (adaptation/coping measures). Then go back to the exploration of other change observations/perceptions and proceed with this same procedure until the interviewee cannot think of any more changes.

**Note: be sure about the correct wording for this section, especially with respect to adaptation*/coping *measures. People will probably not know if something is an adaptation/a coping, which is why it could be best to ask, right after the description of the change and its effects on people, if they do something about it or not. Also, regarding change observations, use more inclusive question formulations to avoid only visual changes (e.g., use other concepts such as perception or feeling of change).*

1. ***Perceived environmental changes and drivers***
    a. *Explore the changes the interviewee has noticed in the environment* To obtain this information use a benchmark (e.g., since you were young) and ask specifically if they noticed changes in a) the weather/seasons, temperature, rain, wind, storms (atmospheric system); b) the sea, soil, rivers, mountains, snow (physical system), c) the animals, the plants, the fish (biological system); d) the crops, livestock, pastures, diseases (human system); e) any other changes in the local environment. Keep LICCI tree in mind and stop at the change the interviewee mentions (e.g., changes in temperature). Then try to encourage people to go to more precise levels and directions (e.g., increase/decrease in mean temperature). Be careful not to use the term *climate change*.
    b. *Explore since when they have noticed these changes*. Use the timeline from the first section to mark when the interviewee started to notice those changes.
    c. *Explore the causes/drivers of changes noticed.* Write down causal relations noticed by people (i.e., driver of change, consequence of change, cascading effect, etc.). Mark those changes/impacts that seem directly or indirectly associated to climatic factors.
    d. Explore if these changes affect people's living in the area/site and how. Ask this question only for changes that people associate with climate change. The idea here is to see if a change has no effect on people they would not adapt to/cope with it, so the partners do not need to ask for adaptation/coping measures (see below).

2. ***Adaptation/coping measures***
    a. *Explore what households do to confront/adapt to/cope with the climate related changes mentioned.* In this section we aim to explore what people, at the household level, do to adapt to/deal/cope with changes mentioned above (only if the observed change is related to climate change). Thus, we want to link the specific LICCI to one or several adaptation/coping measures (the more the

better). For instance, we want to know if people have changed any activities **and how.** Instead of using the word 'adaptation/coping' try to use expressions that people are more familiar with, e.g.: have you changed your work/your way of working because of... [here observation of a climate related change]? Because of ... [here observation of a climate related change], have you changed the way of living and how? Do you nowadays do things/behave differently (including things which they do more often, more intense)? How? More specifically we are looking at **what** type of local adaptation/coping measures they have implemented (e.g., as response to changes in temperature, precipitation or animal behavior) and **since when** they have implemented them. Try to ask for adaptation/coping measures specific to the different environmental changes observed following the flow mentioned above while trying to go as much in depth as possible. If they talk about changes in crops in general try to find out what kind of change and what crops (species, varieties) they refer to, e.g., diversification (additional crops), shifting from one crop to another (abandoning one crop and starting to grow another one), or shifting the proportion (growing less from one crop but more from another). Try specifically to get adaptation/coping strategies related to their livelihoods but ask for adaptation/coping related to other aspects, e.g., living, behavior. For example, you can ask about changes in activities related to their livelihood (including planning the next season), changes related to their housing, to water usage, to mobility, and so forth (you can use the provided adaptation/coping classification tree to get some inspiration). Break down the responses into single adaptation/coping measures. Example: people have increased total amount of water used for irrigation by irrigating more frequently: 1. Increase total amount of irrigation, 2. Irrigate more frequently. Indicate in the respective column if you think the strategy should be considered as coping (spontaneous short-term palliation actions) and why. It is possible that the interviewees do the same thing to confront/adapt to/cope with more than one environmental change. If the interviewees mention an adaptation/coping measure is carried out by an NGO, please try to find out if the adaptation/coping requires an active part from the household members (e.g., if crop diversification was promoted by an NGO it still requires the active decision of the households to follow the recommendation). Note who is driving the adaptation/coping in the column 'agent'. Select an appropriate category from the adaptation/coping tree (feel free to ask the LICCI core team for help) and indicate the direction of change (e.g., increase, decrease, earlier, later). The adaptation/coping tree can be found in the 'Deliverables CSV - First-Checkpoint' and on the LICCI webpage.

Important comments:

a. Sometimes it is difficult to get adaptation/coping measures from the SSI and you might get more information on applied adaptation/coping measures through other approaches (e.g., conversations with people, observations, and so forth). Stay observant for activities that people may be doing that can be considered adaptation/coping measures (use the adaptation/coping classification tree to know what you should pay attention to). Include those in your list of local adaptation/coping measures to cover the full range of adaptation measures.

b. It is possible that people tell you adaptation/coping measures when you are asking about LICCI. Stay attentive not to miss them.
c. Be aware that the same adaptation/coping measure could be used as one response to several (different) LICCI and several different adaptation/coping measures might be applied as responses to the same LICCI.
d. We try to understand the interlink between adaptation/coping measures and local observations of climate change impacts. During the SSI try to obtain those relationships by asking for adaptation/coping measures for the different LICCI reported. If you are not sure about certain links do not hesitate to ask again. If you get the adaptation/coping measures from observation or other approaches than SSI please use your own best judgement to link the adaptation/coping measures with LICCI identified/validated.

Expected outputs: Partners should keep raw data (i.e., transcripts, recordings of the interviews, and field notes, etc.). Researchers should not submit raw data, although part of it might be required for clarifications. Partners should produce and submit the following documents summarizing results from these interviews **(notice that some of this information will be validated in FGD):**

1. ***An ordered list of all changes perceived in the study site***. Be aware that this output is collective, so it is an aggregation of all the individual interview outputs. The classification of a change as LICCI will be later discussed in the FGD.
2. ***An ordered list of all local adaptation/coping measures in the field site.*** Be aware that this output is collective in manner, so it is the aggregation of all the individual interview outputs and additionally from researcher's observation and casual conversations with people.
   For the output table, please check the Output Manual

*Note: We will limit the number of adaptation/coping measures included in the survey to 10. Only those adaptation/coping measures that are mentioned by interviewees or observed by researchers in more than two households should be included. If more than 10, randomize the ones to be included in the survey and test to see if there is variation (see section on 'selecting adaptation/coping measures' for further details).

Focus Group Discussion

Goal: To discuss, validate, and identify LICCIs through group decisions.

***Sampling* (site level).** The specific number of Focus Group Discussion (FGD) will be different for each case, and will depend on the local context (e.g., village size and number and characteristics of the selected villages). If possible, sampling should be done following the sampling recommendations specified below.

Number of FGDs: We aim to organize 2-4 FGDs per site, spread in different villages as much as possible. More than one FGD per village can be conducted depending on:

1. village size (e.g. in very large villages), and
2. whether there are conflicts or power imbalances within the village. For example, if in a village there is a gendered division of tasks or power imbalances,

separated women's and men's FGD should be conducted. In the same way, if in the village there are conflicts between the different groups practicing the primary activities, or power imbalances between youngsters-elders, separate FGDs for each of the sub-groups should be organized.

Selection of FGDs participants: Between 4 and 12 participants will participate in each FGD. Participants will be selected through convenience sampling aiming to capture the site diversity in terms of livelihood activities (e.g. farmers, fishermen, hunter-gatherers, etc.), expertise (i.e., special preference will be given to inviting elders or local experts to the FGD), age and gender.

Important Note about what to bring to FGDs from SSI: Partners are expected to generate an exhausitive list of local observations of changes (i.e. it is hotter in summer) from the semi-structured interviews, and then code all the observations to LICCIs (please check the LICCI classification, https://licci.eu/ressources/licci-classes/index.html , and pg. 71-88).

What to bring to the FGDs:

- **Controversial observations**, for example, regarding the same observation, some interviewees attribute it to climate change, while some others attribute it to other drivers. (i.e., the observation of 'animal diseases are bcoming more often', some interviewees say it is because of the weather has become hotter, while others say it is because of the overuse of pestisides)
- **Reserchers' judgement,** in cases when interviewees do not attribute observations to climate change, however, the researcher considers them as climate change related.

What **NOT to bring** to the FGDs:

- Observations falls under the category of 'climatic systems' (see the LICCI classification), i.e., temperature, rainfall, etc. will be automatically considered as LICCI.
- Observations reached a consensus of climate change related from the SSI, (i.e. 95 percent of the interviewee consider 'hill rice now yields less' because 'the weather is too hot').
- Observations that are clearly not climate related.

Procedure:

Before organizing a focus group discussion:

1. The researcher should inform the village leaders. Not doing so can be considered impolite and a possible violation of the rules and regulations, which could result in obstructing the research activity. The researcher should coordinate the selection of participants under the assistance of village leaders; the researcher should notify the community representatives (village leaders) of the meeting, while looking for their permission for the activity; explain in detail the implemented methodology; the importance of the activity for the project and the community; and the possible results of the activity.

2. The researcher should schedule the activity (considering what is feasible) on a date and time where no other important community activities take place. The researcher should also schedule the activity in a specific location (i.e. public space in the village, classroom, etc.). If possible, the researcher should invite another person (i.e. people who work with NGOs or local organizations, research assistants, local collaborators, etc.) to help facilitate the FGD. If the researcher conducts the FGD on his/her own, in order to capture complete information, s/he should ask for consent to record the session.
3. The researcher should invite participants several days in advance and remind them about the activity a day before to ensure their participation. All participants invited should be informed that the attendance is on a voluntary basis.

During the focus group discussion:

1. The researcher should explain in full details the used methodology being used and its importance for the project and for the community, and the possible uses/applications of the results.
2. After the presentation, the researcher should start the activity with a set of questions/statements prepared beforehand; followed by interesting leads (linked to the theme), without getting side-tracked.
3. Researchers should encourage the participation of each attendant and support discussion and reflection on each question/topic, always respecting participants' comments.
4. Researchers should ask for permission to take pictures. If allowed, researcher should take pictures during the activity and take notes of the responses (using the way which best fits them).
5. Once the information is gathered, the researcher should review it once more with all participants to verify its completeness and accuracy.
6. Thank the participants for their collaboration and offer to leave a copy of the results at the community center (or wherever suits the local context).

Protocol: The duration of FGD will vary depending on the context and the level of participation. However, the researcher should keep in mind to restrict the activity to 2-3 hours, otherwise it could become tiring and a burden for the participants. Below, it is reported a general guideline for LICCI partners. It is not mandatory to follow it step by step. However, it is important to have all the key points covered, and to adapt the language to the local context.

1. Welcome

Welcome, I want to thank you all for coming today. My name is XXXX, and I will be the facilitator for today's group discussion. I am a researcher/Ph.D. student/postdoc fellow and I work for the LICCI project, funded by ERC and based at ICTA-UAB in Barcelona, Spain. We also have XXX present to take notes for us (in case the research is working on his/her own and recording is needed, ask consent to do so).

Today, we have invited you to take part in this group discussion because you are (the role of the community). We would like to talk with you about changes in this village, and particularly changes generated by changes in weather and climate. What we learn from today's discussion

will help us improve understandings on how local communities contribute to understand current changes.

2. ***Ground Rules***

Before we begin, I would like to review a few ground rules for the discussion.

a. I am going to ask you several questions; we do not have to go in any order, but we do want everyone to take part in the discussion. We ask that only one person speaks at a time.
b. Feel free to consider this as a discussion and respond to what others are saying, whether you agree or disagree. We are interested in your opinions and whatever you have to say is fine for us. There are no right or wrong answers. We are just asking for your opinions based on your personal experience. We are here to learn from you.
c. Do not worry about having a different opinion than someone else. But please do respect other's answers and opinions.
d. If there is a question you do not want to answer, you do not have to.
e. We will treat your answers as confidential. We are not going to ask for anything that could identify you and we are only going to use first names (anonyms if necessary) during the discussion. We also ask that each of you respect the privacy of everyone in the room by not sharing and/or repeating what it has been said here and that could identify anyone in the room.
f. Optional: we are tape/video recording (depending on whatever device the partner has) the discussion today and taking notes because we do not want to miss any of your comments. The recording will be for internal use only and will not be public accessible/available in any format. However, once we start with the recording, we will not use anyone's full name and we ask you to do the same. Is everyone okay with this session being recorded? (**GET VERBAL CONSENT TO RECORD DISCUSSION. IF A PARTICIPANT DECIDES THAT S/HE DOES NOT WANT TO BE RECORDED AND WANTS TO LEAVE, PLEASE RESPECT THE DECISION**).
g. We will not include your names or any other information that could identify you in any writing forms. We will securely storage the notes after we complete our study and publish the results.
h. Finally, this discussion is going to take about two to three hours, and we ask you stay for the entire meeting.

Does anyone have any questions before we start?

3. ***Introductions*** (~5-10mins) [Start record now if needed] I would like to go around the table starting on my right (or left) to have each person introduce him/herself. Please tell us your first name only.
4. ***Group Discussion*** – (~ 2 hours) Use the list of LICCIs extracted from previous semi-structured interviews for this topic (only those that have some level of controversy) and prepare it to use the table format (see output). **As the local indicators will be validated at the LICCI level instead of the observation level, it is suggested to use observations extracted from the SSI to open and guide the conversation.** For example, if the researcher has ¨changes in temperature¨ on the list, use examples such

as ¨people mentioned that it has become hotter/warmer¨ to give the participants a clearer picture.

Topic: Local Indicators of Climate Change Impacts (LICCIs)

I would like to discuss with you a list that I compiled before this meeting. I have been talking to people in the community regarding changes in this area. I would like to hear your opinions on each of them.

a. Start with the LICCI list gathered via semi-structured interviews. Ask the participants if they have noticed those changes; when did they happen; what has caused them, and in which direction do they go.
    - PROBE: If it is related to climate change, when did the observation of changes start to happen in the community?
    - PROBE: If it is not related to climate change, what is it related to?

   (To record the level of agreement, partners do not need to ask participants hands-up, simply observe the vibe in the discussion would provide enough info)

b. What are other changes you can think of, that are not on the list we have talked about? If new observations of changes are mentioned, follow the same structure to ask drivers and impacts.

5. ***Final Thoughts*** (~5mins). Those were all the questions that I wanted to ask, does anyone have any final thoughts about all the changes happened here in the community that you did not have chance to share?
6. ***Review and Wrap-up*** (~5mins). Thank you all for coming today and for sharing your opinions with us. We hope you enjoyed the discussion today. We will get the results back to the community as soon as we finish the analysis.

As in each FGD participants might perceive different impacts/importance or report different timelines and drivers, we will combine information from the various FGD conducted in a site to identify overlaps and differences.

Output: The main idea is that the participatory, collective, and iterative nature of the process will produce a final list of LICCI that reflects the group social memory. Researchers should therefore provide 1) a list of validated observation of changes per FGD with the indication of the level of agreement. The validated observations of changes should be coded into LICCIs by indicating their directions (specify the scientific names of species if mentioned). Moreover, choose the life forms of the mentioned species and their uses and/or the mentioned parts; 2) a page summary of the timing and drivers of changes; and 3) a brief description of how the FGD proceeded (e.g., power relations). The final list of LICCIs will be classified according to whether they impact the a) climatic, b) physical, c) biological, or d) human system.

For the output table, please check the Output Manual

Survey

General considerations

Goal: The aim of the survey is to collect information about how LICCIs are perceived by various groups and to understand patterns and drivers of variation in these perceptions, in a way that allows comparability between sites. The survey is divided into two parts, one to be applied at the household level (focusing on household composition, livelihood strategies, socio-demographic characteristics and adaptation/coping strategies), and the other to be applied at the individual level (focusing on perceived LICCIs and corresponding impacts).

Sampling overview: We will follow two different sampling strategies: (1) for the selection of the **households**, we will use *simple random sampling* (N=125); (2) for the selection of the **individuals**, we will use *convenience quota sampling* (N=175). The discrepancy between the number of household surveys and individual surveys means that more than one person per household can be interviewed for the individual part of the survey. A maximum of two people can be interviewed for each household: when they are both household heads and the individual part of the survey takes place separately.

Household sampling: We aim to select a minimum of 125 households, which should be selected by using a *simple random sampling*, according to one of the following methods:

1. If there is a village household census available, assign a number to each household from the village census. Using a random number generator (e.g. https://www.random.org/), select households until you reach the required sample size.
2. If there is a map or an aerial photo available, number all the households in the site on the map and randomize as it is explained in (1).
3. If there is no census or no aerial photo, draw a village map and number the households and randomize as it is explained in (1).

Other considerations:

- If the total number of households in your site is less than or equals to 125, select them all. If the number of households is greater than 125, divide the 125 sampling units proportionally (according to village size) between the number of villages. We recommend you to over-sample 5-10% as back-up in case some households refuse to participate in the study, or in case some surveys are incomplete;
- The questions do not have to be asked *verbatim*, as this might create awkward situations in some contexts. However, to avoid biases, it is very important to understand the meaning of the question to be able to reformulate it adequately.

Individual sampling: We recommend every partner to conduct about 175 individual surveys, being 150 individual surveys the absolute bare minimum, below which the dataset will not be considered complete. To apply the individual part of the survey, we will follow the *convenience quota sampling*, which means the partner can ask the individual-level questions to whoever is available at the household at the time of the interview, making sure that the sample is approximately evenly distributed across gender (i.e., 40-60% men and 40-60% women) and age category (i.e., approximate equal numbers of young adults, middle-aged adults and elders).

Within each household we aim to interview 1-2 household heads. We consider both male(s) and the female(s) household heads. If several generations live together in a house and share production and consumption, more people might qualify as household heads.

In practice, follow these steps to conduct the survey at household and individual levels:

1. Randomly select the households to be visited, using one of the strategies described above (i.e., census, aerial photo, and drawings of the village);
2. Upon arrival to the household, interview whoever is available as long as this person is a household head. Apply the household-level part of the survey, which can be answered by one or several people present in the household;
3. Then, move to the individual part of the survey. This part needs to be applied individually. Try to establish a one-to-one conversation with the interviewee by avoiding interferences of other people;
4. Optionally, you can apply the individual part of the survey to another household head *as long as this person was not present during the first individual survey*. Try to interview another household head with a different gender and age from the first person interviewed (e.g., if the first person interviewed was an old woman, try to interview a young adult man);
5. Keep track of the gender and age of the individuals with whom you conducted the individual part of the survey. If you note that your sample is biased towards a given gender or age category, you should plan visits to households in times/days to maximize the chance to put the individual-level questions to people who are under-represented in your sample. For example, if you have too few women in your sample and you know that men are usually out of the house during the morning, visit households during the morning to increase the chances of interviewing women individually. Always avoid creating uncomfortable and/or culturally inappropriate situations.

Expected outcome: 125 household-level and 175 individual-level surveys completed.

Constructing the survey

To be comparable across sites whilst being locally relevant, all the surveys must be constructed using the same structure but adapting some of the questions to each site. Here is some guidance to adapt specific parts of the survey to the specific site. To ensure that the included questions follow the required structure, ***partners are required to discuss the draft version of the survey with the LICCI core team before starting survey data collection***.

Selecting assets with market value to measure variation among household: Assets with market value will be selected by using contextual information from the site. The idea is to select assets which reflect variations across households in a site. For example, if everyone has a machete, then a machete does not reflect the variation and thus is not a good item to be included in the survey. The idea is to have some items owned by few people (rich people), items owned by a good number of people (average), and items that most people (but not all) have. Partners should select 15 assets that meet the above criteria and include the 10 that show more variation in ownership in the final survey.

*NOTE: Main livestock species from the site card will be all included in the survey.

Selecting activities for a measure of variations on ILK levels: We need to select two activities to be asked to all individuals participating in the survey. If division of labor in your site is gendered, then select an activity in which (a group of) men are often mentioned as most knowledgeable, and another one in which women are more often mentioned. If the division of labor follows another structure (i.e., cast), then use it to select the two activities. For testing the survey, select four activities. In the past, we have seen that questioning about expertise might be sensitive in some particular activities, therefore, select an activity that does not make people uncomfortable. It is good to test several activities to select two to be included in the final survey. The gathering of wild plants and fungi for food are activities added automatically to the survey. We will rely on self-assessment with common baseline of "knowledgeable people in the village" (however, this is locally defined). In the survey, you should include questions related to two activities (plus gathering wild plants for food, which is automatic), and ask appropriately. The questions should take this form: "Compared to [knowledgeable group], who are knowledgeable about [activity], how much of their knowledge about [activity] do you have?"

Selecting LICCI to ask questions of perceived impacts: LICCIs to be included in the survey come from the list generated through SSI and validated in the FGD. To select LICCIs, make a list of all the LICCIs codes mentioned in your site. Remember the following considerations to identify a LICCI:

- All observations of change in the climatic system (i.e., temperature, precipitation, air masses and seasonal events) should be considered a LICCI.
- Drivers: Changes can be driven by different factors (not only climate change). Since we are collecting perceptions, changes in physical, biological, and socio-economic systems will be considered LICCIs if informants attribute them to changes in the climatic system.
- Time scale: consider changes within a certain temporal width (not from last year).

From the list of LICCIs, randomly select 30 for the pilot survey. If one LICCI corresponds to more than one observation, use the observations to exemplify the LICCI (the random selection should be done at the level of the LICCI, not the observation). To select the LICCI for the final version of the survey, select the ones that reflect more variation during testing (i.e., a LICCI that not everybody knows). Each survey should include at least 15 LICCIs, depending on the total number of LICCIs documented.

Selecting adaptation/coping measures: The selection of adaptation/coping measures that will be included in the survey is based on the results of semi-structured interviews and follows some criteria that are described below. In general, adaptation/coping measures should be 1) strategies on which household's members have agency (i.e., not including "receiving help") and 2) current practices.

General considerations on adaptation/coping measures within the LICCI project:

We are aware of the difficulty in evaluating whether an action can be considered as adaptation/coping measure to climate change. For the selection of adaptation/coping measures within the LICCI project we propose the following approach.

1. We are interested in both, adaptation to (long-term transformation process of enduring adjustment) and coping with climate change (short-term process of temporary adjustments) (see *Definitions*).

2. We include measures that facilitate future adaptation/coping (e.g., sharing knowledge, planning).
3. We are interested in adaptation to/coping with climate change. Thus, during the semi-structured interviews we will ask for adaptation/coping measures (e.g., change in livelihood/living/behavior) for each mentioned local indicator of climate change impacts. At the same time, we assume and accept that many adaptation/coping measures are driven by more than one stressor. Keep all adaptation/coping measures related to climate change obtained through the SSI and/or valuated as such by the researcher.
4. We are interested in measures that aim at reducing harm and/or exploiting beneficial opportunities of climate change (see *Definition*).
5. Adaptation/coping measures should reflect a change (adjustment), which means that they reflect measures that households currently do and that they did not do in the past, or that they more or less do now or do differently than in the past.
6. We are interested in adaptation/coping measures that are still performed/applied by at least some households in the study site.
7. We are interested in adaptation/coping at the household level. This means:
    a. The adaptation/coping measure brings benefits to the household members, not only to an individual.
    b. The household has (at least to some part) an active role, e.g., by carrying out/realizing/performing the adaptation/coping measure, or by taking decisions. The measure can be initialized or promoted by an external agent (e.g., NGO, government) but there must be an active part from the household members. For example, we consider compensatory payments from the government as measure at the national level and will not include them in the household survey.
8. If you feel or realize (beforehand or during the testing) that an adaptation/coping measure could have ethical or legal implications and/or creates uncomfortable situations, do not include it in the survey but keep it in the results from the SSI.
9. For final survey, exclude all adaptation/coping measures that were mentioned only once during the SSI.

In many cases, to evaluate adaptation/coping measures will not be an easy task and require thorough discussions between the partners and the LICCI core team.

Selection procedure of adaptation/coping measures for the survey:

Out of the list of adaptation/coping measures derived from the semi-structured interviews (SSI), other conversations and observations, shortlist/select those that fit the above listed criteria. If there are less than or equals to 10 adaptation/coping measures left, select them all for the survey. If there are more than 10 adaptation/coping measures left, randomly select 20 for the pilot surveys but only 10 for the final survey. To select adaptation/coping measures for the final version of the survey, select the ones that reflect more variation during testing (i.e., adaptation/coping measures that some people do but not everybody does).

In the survey, we aim to understand adaptation/coping barriers and adaptation drivers (including adaptation/coping enablers/facilitators). Keep in mind that the response is in text format, and the researcher should expect more than one barrier/driver.

(1) Barriers (Why not?): We want to understand the diverse reasons why people do not adapt (e.g., what hinders them to do so). The reasons might include:

- low appraisal of climate change impacts and other risks (not related to climate change)
- low benefits from adaptation/coping measure
- low ability/capacity to apply the adaptation/coping measure
- low willingness due to other reasons

(2) Drivers (Why?) We're interested in finding out the diverse reasons why people began and continue to use particular adaptation measures. These reasons might include:

- personal evaluations of the risk that climate change and other risks poses and the likelihood that they will experience significant impacts
- the benefits that they see for themselves, their households, their families and/or their communities of implementing the adaptation action
- enabling conditions that enable them to undertake the adaptation option, e.g. five capitals, cultural norms and expectations, supportive institutional environment

When asking about adaptation/coping in the survey, structure the questions in a way similar to the wording of the original responses from the SSI and do not use the adaptation/coping categories of the adaptation/coping tree (in the following Local Adaptations of Climate Change Impacts (LACCI) categories). This tree is a living document and will evolve over time. The first version will be uploaded to the LICCI webpage by October 2019. We will only use the LACCI categories to group responses for data analysis. The aim of this part of the project is to develop an inventory of household adaptation/coping measures, barriers and drivers in Indigenous and Local communities.

Understanding seasonality: It is important to keep in mind that the survey reflects local definitions and terminology for seasons, as well as the seasonal patterns of temperature and rainfall (this information is gathered during the SSI and the FGD). Avoid questions that are not suited to the local weather, such as asking about 'hot' or 'cold' season in places where temperature varies little throughout the year.

Testing the survey

The protocol for constructing and testing the survey might vary across sites and among partners. Therefore, it is vital for partners to take into consideration of the specific context of the study site and to communicate with the LICCI core team. In sites where internet is accessible, partners are encouraged to contact the LICCI core team members about doubts and issues as they arise. In sites where internet access is not stable, the partner should send a draft version of the survey, and the results of 10 pilot surveys to the LICCI core team along with outputs from the SSI and the FGD. Upon receiving the pilot survey results, the LICCI core team will double check if there are issues and communicate with the partner, so that the partner can finalize the questionnaire and start the survey data collection.

A draft version of the survey must be tested with 10 informants. This draft version should include 15 assets, 30 LICCIs, and 20 adaptation/coping measures. Results from the 10 informants will be used to select the items/LICCIs/adaptation/coping measures with more variation for each site. This is very important to ensure the quality of the data.

Household and individual-level surveys

The survey data can be collected directly on the data collection app using the tablet device. Partners can also opt to conduct surveys using paper (a printed version of the surveys is included in the ***output manual***). Nonetheless, later on, the data need to be uploaded in the data collection app, installed in the tablet or in a personal computer.

For the output table, please check the Output Manual

Pebble game instructions

Goal: To measure the relative importance of different livelihood activities, to study participants, and the level of direct dependence on natural resources.

Sampling: This module is part of the individual survey, and information should be collected for each individual in the sample. In each site we will aim to have a minimum sample of 175 surveys in total.

Background: We will use the 'pebble distribution method' (Colfer et al. 1999; Lynam et al. 2007), in which study participants are asked to distribute a given number of points ('pebbles') across different items based on their relevance for a given purpose. Here, the items are the different livelihood activities practiced locally, and we will ask study participants to distribute points based on the **time invested (individual level) and income obtained (household level)** for each activity. Livelihood activities include natural resource-related activities as well as other activities that are unrelated to natural resources (see *Definitions*). The number of points allocated to each activity will be used as a measure of the importance of that activity to the study participant, and the number of points allocated to natural resource-related activities will be used as a measure of the individual dependence on natural resources. For each partner's site, select only the livelihood activities that are practiced locally, based on the information obtained during the semi-structured interviews.

Conducting the exercise:

Materials needed:

- 100 small items of similar size. Examples: small stones, pebbles, seeds.
- Cards containing names of livelihood activities and a visual representation of each (e.g., agriculture can be represented by a crop, hunting by an animal, etc.).
- A flat and spacious surface in which the exercise will be conducted (e.g., floor, table). Make sure that the chosen surface is in a comfortable position for the study participants.

Procedure:

1. Start by providing a brief explanation of the goal of this exercise.
2. Introduce to the study participants the cards containing the livelihood strategies, one by one, and arrange them in a flat surface. When mentioning the names of the livelihood strategies, give examples that correspond to the local context (e.g., for the category 'extraction of natural resources', you can mention names of products extracted locally).
3. Introduce to the study participants the points (pebbles) and explain their meaning. Giving an example while showing the full set of points could be useful, for example: *'imagine this is all the time that you have in your life'.* Tell the respondents that they should not worry about counting the points.

4. Ask study participants to distribute points across different cards. We will conduct two separate exercises. First, respondents will be asked to distribute the points based on the **time** they have dedicated to each activity throughout their lifetime; second, based on the **income** that their household received from each activity. Remember to remove all points before asking the following question. The questions could be formed as following:

   *'Please distribute these points based on the **time** you have dedicated to each activity **in your lifetime**'*

   *´Please distribute these points based on the **income** that your household* received from each activity **in the last year**´*

   * note that here you should ask about the income at the household level.

5. After each question, and once the points have been distributed to the cards, the partner should use the information presented to confirm (and, if necessary, ratify / correct) the answers given by the respondents. For example, if half of the points have been assigned to fishing, you can ask the study participant *'so, you have spent half of your lifetime doing fishing-related activities'?*

6. After each question, and once the points have been distributed and the information has been ratified, count the number of points allocated to each activity and upload this information in the corresponding table in the data collection app.

Data entry and management

Goal: The LICCI core team aims to receive research data and outputs from the partners in English and in standardized formats according to a predefined schedule. This shall guarantee the data from different study sites are available in a uniform format.

Communication with the LICCI core team: Whenever you have concerns, feel free to contact the LICCI core team. Your LICCI Buddies would always be the first option to reach out, if not stated otherwise (remember your buddies). The list of contact information of the LICCI core team is at the beginning of the manual. The partners will have access (login is required) to all important documents related to data collection (e.g., manual, presentations) on the LICCI webpage.

Data management: Data should be treated in a highly confidential manner and make sure that no one else has access to the data, neither to the ones written on paper nor the ones on electronic devices. Use password protection for all electronic devices and consider additional password protection for folders and files.

Data that must be submitted: The required data types and formats for submission are described in the respective sections.

The following data must be submitted:

1. Ethical clearance: Before data collection starts, all partners need to file and submit the ethical clearance, either from her/his home institution or from the Universitat Autònoma de Barcelona (UAB).
2. Background data: weather data (please complete the questionnaire on available weather data beforehand), and GPS data.
3. Site and village cards, data from SSI, FGD, and the surveys.

Timing: After finishing the training workshop at the Universitat Autònoma de Barcelona (UAB) the LICCI partners have 12 months to collect and transfer the complete data set to the LICCI core team. However, there are three important moments (check points) at which certain documents and sub-sets of data have to be submitted:

Check point 1: Before going to the field

1. Required documents to be submitted:
    a. A proof of the ethical clearance from partners' home institution or a letter stating the home institution does not have such procedure.
    b. A description of the data collection and a data management plan adapted to the partner's field site ('Procedures for data collection and data management plan of LICCI Partners', prepared by the LICCI core team).
    c. A signed 'Release and waiver form'

Check point 2: Six months (maximum) after attending the training workshop. Please get in touch with the LICCI core team!

At this point, the partner and the LICCI core team will discuss the results from the 10 tested pilot surveys and the construction of the survey based on the outputs from SSI and FGD. This is a very crucial moment, so a steady internet access is required. This consultation is a requirement for continuing data collection. For a better and smoother planning of this consultation, please let your buddies of the LICCI core team know in advance about your schedule, including when you are planning to go to the field, when you are planning to be back for the consultation and what is your (approximate) time slot for the consultation before heading back to the field.

1. Please get in touch with the LICCI core team for consultation
2. Required data and documents to be submitted:
    a. Background data (i.e., weather data, and GPS data),
    b. Site Card and Village Card,
    a. Data from SSI and FGD,
    b. 10 tested pilot surveys,
    c. Proof of the FPIC (applies for those who got the ethical clearance from the UAB).

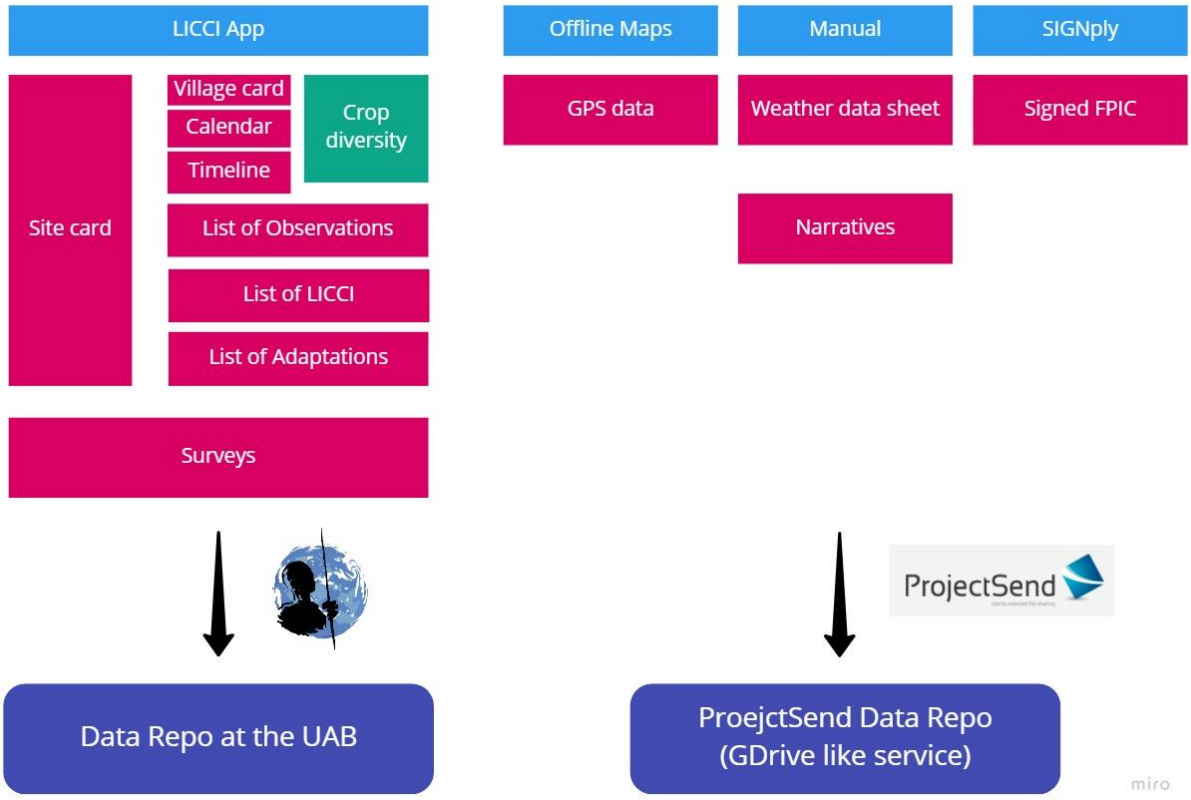
Check point 3: Twelve months (maximum) after attending the training workshop

1. Required data and documents to be submitted:
    a. Data from the surveys,

b. Proof of the FPIC (applies for those who got the ethical clearance from the UAB).

Data format: The expected data and outputs are described in the respective protocols.

Submission tools: All data (if not otherwise stated) will be transferred to the LICCI core team by uploading the data to the personal account of each partner in the LICCI data repository (ProjectSend). For further details, please see the description in the Technical Manual.



Other possibilities for collaboration

LICCI partners can participate in the project in many other ways. Here is a list of some ideas on how you can help us conduct and disseminate results of this research:

- Writing a blog for disseminating research. We can publish it in the LICCI newsletter;
- Translating the protocols or the LICCI webpage to other languages;
- Disseminating the project through social media;
- Sending pictures for the webpage or other dissemination purposes;
- Conducting a workshop/webinar in your country/area so other people can enter data in the web-based platform;

Security and safety protocol while abroad

The safety of yourself and your co-workers should be the number one priority. Fieldworkers are often in a vulnerable position, being strangers in the area and often considered “rich” and therefore an often target of crime. The situation varies considerably across countries, so the rule of thumb may not apply equally to all the locations. But everyone should take necessary precautions to minimize the risk by following some basic rules:

General

- Do not wait till you are sick or in an emergency to find out who are the most reliable doctors and health clinics close to you and in the country. Always register with a local doctor/health clinic upon arrival to the field site and keep their contacts (phone/email/address) in the case of an emergency.
- Make careful choices about study villages, avoiding/abandoning, if possible, the ones which are conflict-ridden or where conflict would possibly emerge.
- Give full details of medical aid, next of kin, contact numbers, ID number, etc. to the local partner institution, or someone that you are working with (but who do not accompany you to the field). They should also get the detailed plans of your field trip (where and when).
- Make photocopies of your passport, visa, and vaccination card, and try to get an official stamp on the photocopies to verify that they are authentic if necessary. Consider leaving the originals in a safe place in the city, while you carry the validated photocopies with you to the field.
- Keep the local officials, village chief, police station or other relevant authorities informed about your stay and movements. Avoid going completely alone to the meetings, but if necessary, inform a trusted contact about when, where and with whom the meeting will take place.
- Bring a cell phone, if the area is connected.
- Consider that "Murphy's Law was written in the field": many plans in study sites can go wrong, so have a contingency plan ready by the time you get to you field site. Make new contingency arrangements whenever you move to other places or situations change. Thus, with your research partners, go through some basic safety routines: *What do we do if: the car breaks down, a research team member is attacked or gets sick, etc.*

Crime

- If possible, ally with some local family in each village you work so that you locally "belong" under someone’s custody.
- Make some security assessment when choosing accommodation sites (a local trustworthy family may be the best option).
- Take seriously any threat from individuals you might receive at your study sites.
- Avoid openly exhibiting valuables as much as possible, which might label you as a target for economic crimes.
- Beware of participating in "dubious" social gatherings (e.g., with lots of alcohol involved) after dark when alone and unprotected.
- Be careful when hitchhiking, or offering lifts to strangers, especially when alone, in remote areas, and/ or after dark.

- Be careful driving after dark. Wrap up your fieldwork early enough to reach home before dusk (this may mean leaving out that last questionnaire, transect, etc.).

Medical

- We recommend that LICCI partners visit a travel clinic or medical center to get appropriate vaccinations before conducting fieldwork.
- All researchers/students visiting the field have proper health insurance coverage. Read the description of the policy, as so you would know what the insurance covers, and have an electronic AND printed copy of your insurance policy with you in the field.
- Driving is probably the activity that entails the highest risk. If you rent a vehicle (and driver), you set the rules. Tell the driver to slow down or set maximum speed limits.
- Carry ID and medical aid details as well as a first aid kit.
- Make contacts with local doctors or hospitals to check out the available assistance in cases of emergency. Make contingency plans.
- If someone gets sick, another person should take charge. Do not leave it to the sick person to decide; often they are unable to make rational decisions.

Basic guidelines of ethical conduct especially for LICCI Core Team members while working in the LICCI project

This research adheres to the codes of ethics of the Society of Economic Botany (http://oldsite.econbot.org/_about_/index.php?sm=03) and the International Society of Ethnobiology (http://www.ethnobiology.net/what-we-do/core-programs/ise-ethics-program/code-of-ethics/). Researchers need to be familiar with them. Additionally, there is a code of conduct for every member of the program that includes the following:

1. No sex with people from the study site, either indigenous or non-indigenous
2. No drinking of alcoholic beverages beyond one or two social drinks. Moderate drinking in public in the community when it is part of a communal event is fine. Under no circumstance should researchers get drunk with people in the study area.
3. No use of any drug that is illegal in the country where research is being conducted.
4. Avoid providing credit to subjects.
5. Should someone in the community require emergency medical evacuation try to be as helpful as possible.
6. Policies on stealing by subjects: ignore it unless the item stolen is very valuable; do not hold a grudge.
7. Do not distribute cigarettes, coca leaves, alcohol or any other additive substances to subjects.

If LICCI Core Team members break any of the above rules, the project reserves the right to dismiss the member at no extra cost to the project.

Publication policies

The following publication policies have been discussed and agreed by the LICCI core team. LICCI core team members are expected to follow them. LICCI partners will have the

opportunity to read them and raise any issue before signing the contract. The signature of the contract implies that the LICCI partner agrees with this general publication policies. These publication policies refer to data collected in the different LICCI sites, not on the LICCI web-based platform.

1. Definitions

LICCI core team – PI, postdocs, PhD students, and technicians hired by the LICCI project at ICTA-UAB, as well as the following researchers who have fully participated in the LICCI project from the start: P. Benyei, D. García-del-Amo, V. Labeyrie.

LICCI partner – PhD students, postdocs and/or independent researchers recruited to collaborate with the LICCI project.

Partner dataset – A single dataset from one research site and collected by one of the partners is considered an individual or partner dataset.

LICCI dataset – The LICCI dataset is defined as any aggregation of more than two individual datasets. The ***LICCI full dataset*** includes data from all the sites. The ***LICCI partial dataset*** refers to any subset of at least two partners' datasets merged /combined/analyzed together with a comparative approach.

2. Rights to use partners' datasets

- Data collected prior to the start of this project belongs to the person/s that originally collected the data, not to the LICCI project.
- Partners collecting data within the framework of the LICCI project have full rights over their individual dataset, including the data they contribute to the LICCI dataset and any other data they collect.
- Partners have full rights to publish results derived from their dataset without any member of the LICCI core team (e.g., PhD dissertation).
- Partners are encouraged to publish with their translators/assistants as co-authors.
- LICCI core team members cannot publish using only one partner's dataset without the partner's consent.
- A partner who has no intention to lead a publication with his/her individual dataset might authorize the LICCI core team to do so. In this case, partners must be involved in all steps of the publication preparation and be included as co-authors.

3. Rights to use the LICCI datasets

Preferred publications for LICCI data include 1) refereed journal publications and 2) an entire book in a university press. If a member of the LICCI core team wants to prepare a manuscript for another source (e.g., edited book, non-refereed journal) s/he should first ask for the consent of the rest of the LICCI core team. Translations or modified versions of works into non-refereed publications should appear only after the refereed publication.

To encourage the coordinated publication of case studies, the LICCI core team will organize a "Writing workshop" in the Spring of 2021. All partners will be invited to attend, but we will select those who have done enough preparation to benefit from the workshop. During the

workshop partners will have the opportunity to discuss ideas with other partners and with the core team. At this time, the LICCI core team will also facilitate statistical support (probably through appointments with the data manager working for LICCI).

3.1. LICCI core team members' rights and responsibilities

- Analyzing and publishing results from the LICCI dataset is the right and responsibility of the LICCI core team.
- A core team member planning a publication from Table 1 below, or any other publication using the ***LICCI full dataset*** should invite –early on- all members of the LICCI core team as co-authors.
    - Co-authorship will be then gained by participating in one or more of the different phases of manuscript preparation (i.e., data analysis, comments to the draft, writing specific sections). LICCI core team members who provide punctual comments should be listed in acknowledgements.
    - Draft papers should be circulated among potential co-authors with enough time. If a person does not respond in 15 days, the lead author can assume that s/he does not want to be included as co-author.
    - Draft papers should also be circulated among all partners whose data is being used, even if they are not co-authors. Partners who have a strong reason to disagree with the interpretation of results can withdraw their data from the particular analysis. If a partner does not respond the request for agreement in 15 days, the lead author can assume that the partner agrees with the interpretation.
    - The lead author is responsible for deciding on the order of authors, depending on their participation in generating the original idea, data analysis, and comments to drafts.
    - When circulating the last draft for approval, the lead author should include the co-authors in the suggested order, so researchers who disagree with the order of co-authors have a chance to comment.
- The only exception to this rule relates to the modelling work that A. Schlingmann will be doing in relation to her PhD thesis, as she will be using the LICCI full dataset but not necessarily inviting all LICCI core team members.
- When including the PI (Reyes-García) in a paper, she should be listed as last author, as this position typically designates the "project PI" role.
- Different members of the LICCI core team have first publishing rights to specific sets of information. First rights will be valid for two years from the time the data is cleaned and ready for use (i.e., there is a two-year embargo period). First rights are distributed, as per the table below. Partners particularly interested in any of the topics should contact the listed lead author.

Table 1: Distribution of topics of interest among LICCI core team

Researcher	**Research topic**
Benyei	• Paper using data from LICCI platform to analyze participation trends in the platform (who participates and how their profile influences the quantity, tree level and quality of the LICCIs reported).
Fernández-Llamazares	• Paper using the LICCI dataset to examine the Shifting Baseline Syndrome across all the studied societies.

García-del-Amo	• Paper using the LICCI documented on the literature review and the LICCI entered in the platform to examine overlaps and differences.
Junqueira	• Paper using the LICCI dataset on the correspondence between local and scientific knowledge on climate change impacts. • Paper using the LICCI dataset to examine socio-cultural and environmental drivers of LICCI.
Labeyrie	• Paper using the LICCI bibliographic compilation on LICCI on agricultural systems. • Paper using the LICCI dataset on CC impacts on agrobiodiversity / agrobiodiversity management and its associated local knowledge.
Li	• Paper using the LICCI dataset on the local knowledge per se. • Paper using the LICCI dataset (FGD) on consensus trends on determining LICCI. • Paper using the LICCI dataset to analyze the relation between social demographic info, livelihood activities, and perceived impacts.
Porcher	• Paper using the LICCI dataset to test the relation between climate change impacts and food and/or water security/sovereignty. • Paper using LICCIs on the biological system, plus LICCI bibliographic, plus data on seasonal calendars to explore the characterization of bioindicators.
Porcuna-Ferrer	• Paper using the LICCI dataset on drivers (including but not restricted to CC) impacting agrobiodiversity / agrobiodiversity management and its associated local knowledge (to coordinate with Labeyrie and the crop-diversity group). • Paper using the LICCI dataset on CC adaptation measures related to agrobiodiversity management (to coordinate with Labeyrie and the crop-diversity group).
Reyes-García	• Paper using the LICCI dataset and LICCI bibliographic search to test patters in LICCI distribution across climate areas ***(with LICCI core team and partners)***. H1a and H1b. • Paper using the LICCI dataset to test LICCI distribution according to household's vulnerability and natural resources dependence. H2a and H2b • Paper using the LICCI dataset to test LICCI distribution across sex and age categories. H3a and H3b. • Paper using the LICCI dataset to test the relation between climate change impacts and subjective wellbeing. • Paper using the LICCI platform to explore internal structure of LICCIs (from tree to network).
Schlingmann **Schlingmann/Graham**	• Paper using the LICCI dataset analyzing adaptation/coping strategies and their spatial distribution. • Paper using the LICCI dataset to model drivers and barriers for adaptation/coping on a local, regional and global scale.

Schunko	• Paper using the LICCI dataset to test distribution of perceived drivers and indicators of climate change impacts on used wild plants species. • Paper using the LICCI dataset on wild edibles to test relations between vulnerability of households and perceived impacts of climate change on wild food plants.

3.2. LICCI partners' rights and responsibilities

- The PI will lead a main publication using the ***LICCI full dataset*** including all partners whose dataset is used as co-authors, unless they opt out.
- All other manuscripts using the ***LICCI full dataset***, or most of it, should include a LICCI group author for which we will follow the CSE recommendations (https://www.councilscienceeditors.org/resource-library/editorial-policies/cse-policies/approved-by-the-cse-board-of-directors/cse-recommendations-for-group-author-articles-in-scientific-journals-and-bibliometric-databases/)

- Manuscript using a ***LICCI partial dataset*** should invite for co-authorship partners whose dataset will be used. Partners meaningfully contributing to data analysis or write up should be included as co-authors.
- Partners can propose new publications outputs using the full or partial ***LICCI dataset***. If there are no conflictive overlaps with Table 1, partners can lead these additional publications following the publication policies outlined here.

3.3. Other users' rights

- After the two-year embargo, the LICCI dataset will be open to any other researcher in the group and to the general public (as per the DMP), for which first rights to the LICCI dataset will no longer apply.
- The two-year embargo does not apply to partners dataset, for which partners will retain first rights.
- If a member of the LICCI core team wants to share the LICCI dataset with researchers who are not affiliated to LICCI before the end of the two-years embargo, the LICCI core team member must first ask for the consent of the group. If the consent to use data is granted, the invited researcher will have to abide by the publishing rules of the LICCI core team.
- As requirements might vary from group to group, any form of potential collaboration that is not contemplated in this protocol will be discussed by the LICCI core team.

4. Acknowledgements

Any publication using LICCI data, whether led by core team members of partners, should acknowledge the source of funding as follows: **Research was funded by an ERC Consolidator Grant to Reyes-García (FP7-771056-LICCI)**.

Procedures for data collection and data management plan of LICCI Partners

Version June 11, 2019

Full name	
Field site	
IPLC name	
Start partnership (training date)	
End partnership	

This Data Management Plan is in accordance with the European Research Council (ERC) Horizon 2020 Ethical Guidelines. Further information can be found here: http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/ethics_en.htm. This is a living document that can be modified by partners and the core team.

The LICCI project will collect primary data on local indicators of climate change impacts, households' adaptive/coping strategies and vulnerability to climate change. Primary data will be collected through fieldwork and through a web-based citizen science platform. Additionally, the project will collect secondary data from literature review and online research. The following describes in detail the process of field data collection in my field site and the structure and the formats of the collected data as part of the requirement for the European Research Council (ERC). This data management plan (DMP) closely follows the overall DMP and all changes thereafter. The LICCI partners can always access the latest version on https://licci.eu/training-material/

Data collection

Data on local indicators of climate change impacts will be collected through field data collection in the LICCI partner study site, which belong to IPLCs in XXXXX (Country). Data collection methods will include semi-structured interviews, focus group discussions and face-to-face surveys. For each field site, the LICCI project intends to collect geographical information data (i.e., geographical coordinates and altitudes).

The LICCI project plans to be working with adults in medium- and low-income countries, who will be requested to provide personal data. I am are aware of ethical issues related to the protection of personal data (as per Chapters 5.2 and 6 of the LICCI DMP) and I will take all necessary measures to ensure such protection. No data will be collected without a Free, Prior and Informed Consent (FPIC) of participants (as per Chapter 6.3 of the LICCI DMP).

Table 1: Overview of the collected data

Local Indicators of Climate Change Impacts, vulnerability and adaptation/coping (group perception)		
Method	Type of data	Sample
Semi-structured interviews	Primary (background information)	Knowledgeable key informants, including elders and people considered knowledgeable by their peers.
Focus group discussions	Primary	Elders and local experts, and people practicing different primary economic activities in a village.
Literature review	Secondary (background)	Academic articles on local indicators of climate change impacts published at international, peer-reviewed journals.

Local Indicators of Climate Change Impacts, vulnerability and adaptation/coping (individual perception)		
Face-to-face survey	Primary	Random sample of adults in study villages.
Web-based data collection	Primary	Any citizen in the world willing to enter data.

Anonymization of personal data

Field data will be immediately anonymized by assignation of individual IDs. The table containing the sensitive data (personal information and assigned IDs) will never be openly accessible, but password protected and only accessible to me and the LICCI Core team for a limited time period. LICCI team members will have access to the original identifiers during five years of the duration of the project. Personal information will be destroyed three years after the end of the project. None of the openly accessible data will contain any identifier that would allow users to identify any person. Presentations of intermediate or final findings (e.g., publications or presentations at conferences) will take care to withhold any personal information which will permit to identify participants in order to protect their anonymity. No data, other than a count for an anonymous person unwilling to participate, will be kept from people who do not want to take part in the study. LICCI will keep a record of the number of people deciding not to participate to assess whether this type of attrition biases the results of the research.

In order to ensure the safety and confidentiality of the information collected, all electronic data (questionnaires and transcripts) will be safely stored in XXXXX (location) e.g. an electronic database only accessible to me with passwords. In the case of using video files, before archiving them, I will pixel (digitally obscuring) name badges and faces, and remove date and place information. Regarding protection issues, I will only provide an approximation of the GPS data to hide exact positions should my study site community not wish to expose their GPS coordinates.

Data license

The LICCI project will follow the recommendations stated in the Guidelines on Open Access to Scientific Publications and Research Data in H2020 (EC, 2017). I will collect data of the knowledge of Indigenous Peoples and Local Communities, and I am aware of the sensitivity of the data being collected, particularly regarding the issue of appropriation. To accomplish the above with the mandate of making data as open as possible, while avoiding unfair knowledge use, I will attach the deposited data to a Creative Common license in general, and particularly to the XXXXXX (e.g. Creative Commons Attribution-NonCommercial-ShareAlike 4.0

International (CC BY-NC-SA licence). This license allows re-distribution and re-use of the licensed work and data on the condition that the creator is appropriately credited, the data are not commercially used and that modified data will be distributed under the same license. Additionally, the user has to provide a link to the license and has to indicate if changes were made.

Long-term data preservation

The data will be stored at the XXXXXX (Location) under my responsibility. During the duration of the project, data will only be destroyed if requested by participants. Signed consent forms obtained from the participants will be kept at the XXXXX (Location) until three years after the end of the project. After that period, they will be destroyed. During the data collection period, quantitative and qualitative data will be backed up onto an external disk on a regular basis.

Table 2: Overview of the life cycle of collected data

Semi-structured interviews	XXXXX (e.g. Month 18-36)	No	None	Yes (coded and entered in the online platform)
Focus group discussions	XXXXX (e.g. Month 18-36)	No	None	Yes (coded and entered in the online platform)
Face-to-face surveys	XXXXX (e.g. Month 18-36)	24 months after cleaning	None	Yes (coded and anonymized)
Survey IDs and names	XXXXX (e.g. Month 18-36)	Non disclosed	3 years after project ends	No

Transfer of sensitive data

The team working for the LICCI project will treat any personal information with a high level of consideration, privacy and ethical practice. In the field, all electronic information stored on mobile devices will be protected by password to ensure that it is accessible only to me and XXXXX (LICCI team members, if any). Electronic copies of the data will be transferred and stored in the XXXXXX (e.g. server/ Dropbox / Google Drive) as soon as possible (during or after the fieldwork). In case of data collected on paper, I will keep the raw data in a locked file cabinet at the XXXXX (location), accessible only to and XXXXX (team members, if any). As authorizations for data export are required/not required in the study site, a permit will be obtained and sent to the ERCEA Ethics Review and Expert Management Unit before data is transferred. No personal data will be exported from the EU to countries outside of the EU.

LICCI classification

System	Subsystem	Impacted Element	LICCI	Definitions / examples
Climatic system	Temperature	Mean temperature	Changes in mean temperature (not further specified)	Refers to a general change in temperature, not associated with a specific season or time of the day (e.g., ´nowadays it is warmer than in the past´)
			Changes in the frequency of hot / warm days	
			Changes in the frequency of cold days	
			Changes in the temperature during the night	
			Changes in the temperature during the day	
			Changes in temperature associated with elevation	Refers to changes in temperature associated with elevation. E.g., ´now it is warmer on higher altitudes´, or ´it is now much colder in the valleys´
			Changes in temperature fluctuations	Refers to changes in the variation of temperature during the same day or in days close to each other. E.g., ´before the mornings used to be cold and the afternoons warm, now the whole day is hot´.
		Temperature extremes	Changes in the frequency of heat waves	A ´heat wave´ is a period of consecutive days in which temperatures are much warmer than the average temperatures for that period.
			Changes in the length / duration of heat waves	A ´heat wave´ is a period of consecutive days in which temperatures are much warmer than the average temperatures for that period.
			Changes in the intensity / strength of heat waves	A ´heat wave´ is a period of consecutive days in which temperatures are much warmer than the average temperatures for that period.
			Changes in the frequency of cold waves	A ´cold wave´ is a period of consecutive days in which temperatures are much colder than the average temperatures for that period.

		Changes in the length / duration of cold waves	A ´cold wave´ is a period of consecutive days in which temperatures are much colder than the average temperatures for that period.
		Change in the intensity / strength of cold waves	A ´cold wave´ is a period of consecutive days in which temperatures are much colder than the average temperatures for that period.
		Changes in the frequency of days with extreme temperatures	
	Seasonal temperature	Changes in the frequency of unusual temperatures in a given season	Choose this option if the observation refers to unusual temperatures in a speficic season (e.g., ´now there are cold days during summer´, or ´now there are warm days during the rainy season´).
		Changes in the mean temperature in a given season	Choose this option if the observation refers to a general change in temperature in a specific season (e.g., ´now summers are colder´, or ´now the rainy season is warmer´).
		Changes in the frequency of extreme cold seasons	
		Changes in the intensity / strength of extreme cold seasons	
		Changes in the frequency of extreme hot seasons	
		Changes in the intensity / strength of extreme hot seasons	
	Sunshine	Changes in the frequency of sunny days	
		Changes in sunshine intensity	
Precipitation	Mean precipitation	Changes in mean rainfall (not further specified)	Refers to a general change in precipitation, not associated with a specific season or time of the day. E.g., ´nowadays it rains more than in the past´
		Changes in the number of days with rainfall / rainy days (not further specified)	
		Changes in the intensity / strength of rainfall (not further specified)	Refers to general changes in the intensity of rainfall. E.g., ´rains were heavier in the past´.
		Changes in the intensity / strength of heavy rainfall events	Refers to changes in the intensity of rainfall specifically during heavy rainfall events.

	Precipitation extremes	Changes in the frequency of heavy rainfall events	
		Changes in the frequency of flash floods	Flash floods are floods that occur a short time (3-6 hours) after a heavy precipitation event
		Changes in the intensity / strength of flash floods	Flash floods are floods that occur a short time (3-6 hours) after a heavy precipitation event
	Precipitation distribution, variability and predictability	Changes in variability of rainfall (not further specified)	Refers to general changes in the variability of rainfall. E.g., ´rain is now more variable´
		Changes in temporal distribution of rainfall	Changes in rainfall distribution along the year or between years. E.g., ´rain used to occur throughout the year, now it is concentrated only in a few months´, ´before we had rain every year, now we have some years with a lot of rain and other years with almost no rain´
		Changes in the spatial distribution of rainfall	Changes in rainfall distribution in space. E.g., ´in the past it used to rain in the valleys and up the mountains, now it rains only in the mountains´
		Changes in the length / duration of rainfall events	
		Changes in the predictability of rainfall	Use this category when the local perception of change refers specifically to predictability. E.g., ´now it is harder to predict when it is going to rain´.
		Changes in the frequency of dry spells	A dry spell is defined as a period of consecutive days in which the amount of rainfall is much lower than the average for that period.
		Changes in the length /duration of dry spells	A dry spell is defined as a period of consecutive days in which the amount of rainfall is much lower than the average for that period.
		Changes in the frequency of wet spells	A wet spell is defined as a period of consecutive days in which the amount of rainfall is much higher than the average for that period.
		Changes in the length /duration of wet spells	A wet spell is defined as a period of consecutive days in which the amount of rainfall is much higher than the average for that period.

	Seasonal precipitation	Changes in the amount of rainfall in a given season	Choose this option if the observation refers to changes in the amount of rainfall in a speficic season (e.g., ´now there is less rain in autumn´ or ´the rainy season is now drier´).
		Changes in the intensity / strength of rainfall in a given season	Choose this option if the observation refers to changes in the intensity rainfall in a speficic season (e.g., ´now the summer rains are stronger´, or ´now the rains during the rainy season are weaker´).
		Changes in the variation of rainfall in a given season	Choose this option if the observation refers to changes in the variation of rainfall in a speficic season (e.g., ´now the summer rains are more erratic´, or ´now the rains during the rainy season are less constant than they used bo be´).
	Drought	Changes in the frequency of drought events	A drought is an event of prolongued shortages in water supply, usually from precipitation but may also refer to shortages in ground or surface water. It is usually identified through the observation of multiple biophysical indicators.
		Changes in the intensity of drought	A drought is an event of prolongued shortages in water supply, usually from precipitation but may also refer to shortages in ground or surface water. It is usually identified through the observation of multiple biophysical indicators.
		Changes in the length / duration of drought	A drought is an event of prolongued shortages in water supply, usually from precipitation but may also refer to shortages in ground or surface water. It is usually identified through the observation of multiple biophysical indicators.
		Changes in the frequency of years without any rainfall	
	Clouds and fog	Changes in cloud size / thickness	
		Changes in the number of clouds	
		Changes in the colour of clouds	
		Changes in the frequency of fog or misty days	
		Changes in the frequency of cloudy days	
		Changes in the length / duration of fog	The ´duration of fog´ is defined as the period of time within a day in which fog occurs.
		Changes in fog thickness / density	

	Moisture / humidity, dew and frost	Changes in air moisture / humidity	
		Changes in the amount / intensity / strength of dew	´Dew´ are tiny droplets of water that form on cool surfaces during the night, when atmospheric vapour condenses.
		Changes in the number of days with dew	´Dew´ are tiny droplets of water that form on cool surfaces during the night, when atmospheric vapour condenses.
		Changes in the frequency of frost days	´Frost´ is a deposit of small ice crystals that form on the ground or in other surfaces when temperature falls below freezing.
		Changes in the amount / intensity / strength of frost	´Frost´ is a deposit of small ice crystals that form on the ground or in other surfaces when temperature falls below freezing.
		Changes in the temporal distribution of frost	
Air masses	Wind	Changes in wind strength or speed	
		Changes in the number of windy days	
		Changes in wind direction	
		Changes in wind temperature	
	Storm (wind storm /dust storm/sandstorm/hail storm/electric storm)	Change in the frequency of storms (not further specified)	
		Change in the intensity of storms (not further specified)	
		Changes in the frequency of wind storms	
		Changes in the intensity of wind storms	
		Changes in the frequency of lightning and thundering	
		Changes in the intensity of lightning and thundering	
		Changes in the frequency of electric storms	
		Changes in the frequency of hail storms	
		Changes in the intensity of hail storms	
		Changes in the frequency of sand or dust storms	

			Changes in the intensity of sand or dust storms	
		Cyclones, tornadoes	Changes in the frequency of cyclones	
			Changes in the intensity of cyclones	
			Changes in the frequency of tornadoes	
			Changes in the intensity of tornadoes	
	Seasons	Duration and timing of seasons	Changes in the length /duration /disappearance of seasons	´Season´ is defined by a period of the year usually associated with a particular weather pattern and/or daylight hours, usually identified through the simultaneous observation of multiple biophysical indicators. A ´season´ could have a specific name (e.g., summer, winter) or be named according to specific weather patterns (e.g., rainy season, snow season).
			Changes in the timing (onset or end) of seasons	´Season´ is defined by a period of the year usually associated with a particular weather pattern and/or daylight hours, usually identified through the simultaneous observation of multiple biophysical indicators. A ´season´ could have a specific name (e.g., summer, winter) or be named according to specific weather patterns (e.g., rainy season, snow season).
			Changes in the transition between seasons	´Season´ is defined by a period of the year usually associated with a particular weather pattern and/or daylight hours, usually identified through the simultaneous observation of multiple biophysical indicators. A ´season´ could have a specific name (e.g., summer, winter) or be named according to specific weather patterns (e.g., rainy season, snow season). Use this category when the local perception refers specifically to transitions between seasons (E.g., ´now summer comes suddenly, before it used to come gradually´)
Physical system	Marine physical systems (ocean & sea)	Sea temperature	Changes in the sea surface temperature (not further specified)	
			Changes in the sea temperature in a given season	
		Sea-level rise	Changes in the sea level	
			Changes in the size of waves	
			Changes in the level of tides	

		Changes in the frequency of coastal flooding	
	Coastal erosion/sedimentation	Changes in coastal sedimentation	Changes in the rate / amount of sediments deposited coastal areas, leading to changes in coastal surface, coastline, water depth, appearance of beaches, etc.
		Changes in coastal erosion	Changes in the rate / amount of erosion in coastal areas, leadings to changes in coastal surface, coastline, water depth, disappearance of beaches, etc.
		Changes in the structure of beach soil	
	Ocean Currents	Changes in the speed or strength of ocean currents	
		Changes in the direction of ocean currents	
	Ocean Salinity	Changes in ocean water salinity	
Freshwater physical systems (continental waters)	Mean river flow	Changes in river / stream water flow, volume, level and/or depth	
		Changes in the abundance of river / stream pools	
		Changes in abundance of rivers or streams	
	River and lake floods	Changes in the extension of the area flooded by rivers	
		Changes in the frequency of river / lake floods	
		Changes in the intensity of river / lake floods	
		Changes in the extension of the area flooded by lakes	
		Changes in wetland surface	
	Fresh water availability/quality	Changes in freshwater quality (not further specified)	
		Changes in freshwater availability	
		Changes in freshwater pollution	
		Changes in freshwater transparency / concentration of dissolved particles	
		Changes in freshwater salinity	
		Changes in taste of snow and freshwater	

		Changes in the number of natural freshwater springs	
		Changes in number of freshwater ponds	
	Water temperature of rivers and lakes	Changes in temperature of river water	
		Changes in temperature of lake water	
	Lake / pond level	Changes in level of lake / pond water	
		Changes in the duration of temporary lakes / ponds	
		Changes in the abundance / availability of lakes / ponds	
	Phreating/Underground water	Changes in the phreatic level	
		Changes in the speed of aquifer recharge	
	River bank / pond erosion and sedimentation	Changes in the frequency of river or pond bank erosion	
		Changes in the intensity of river or pond bank erosion	
		Changes in the location of river or pond bank erosion	
		Changes in the frequency of river or pond sedimentation	
		Changes in the intensity of river or pond sedimentation	
		Changes in the location of river or pond sedimentation	
	River / stream / lake seasonal water level	Changes in the timing of seasonal fluctuation in river / stream / lake water level	r level (onset, end, peak, lowest level) that occurs within a year, in environments where seasonal fluctuations of water level occur. E.g., 'now the river water level starts to rise earlier than in the past', 'now
		Changes in the speed of seasonal fluctuation in river / stream / lake water level	Refers to changes in the dynamics of water level that occurs within a year, in environments where seasonal fluctuations of water level occur. E.g., 'now the streams dry faster during dry season', 'now the river water level rises faster'.
		Changes in river / stream / lake water level in a given season	Refers to changes in the dynamics of water level that occurs within a year, in environments where seasonal fluctuations of water level occur. E.g., 'now the river level during the rainy season is lower', 'now during the dry season the lake dries more'

Terrestrial physical systems (Soil & Land)	Soil erosion/landslides	Changes in rain-induced soil erosion and soil loss	
		Changes in wind-induced soil erosion and soil loss	
		Changes in soil sedimentation	
		Changes in the frequency of landslides	
		Changes in the intensity of landslides	
	Soil moisture	Changes in soil moisture / humidity	
		Changes in soil evaporation	
		Changes in soil water infiltration	
	Soil temperature	Changes in soil temperature	
	Soil fertility, structure and biology	Changes leading to soil degradation (not further specified)	
		Changes in soil fertility	
		Changes in soil productivity	
		Changes in soil biota	
		Changes in soil texture	
	Earthquake and tsunamis	Changes in the frequency of earthquakes and tsunamis	
		Changes in the intensity of earthquakes and tsunamis	
Cryosphere (Ice & Snow)	Snowfall and snow cover	Changes in the amount of snowfall	
		Changes in the frequency of snowfall	
		Changes in variability of snowfall (not further specified)	Refers to general changes in the variability of snowfall. E.g., ´snowfall is now more variable´
		Changes in temporal distribution of snowfall	Changes in snowfall distribution along the year or between years
		Changes in the spatial distribution of snowfall	Changes in snowfall distribution in space
		Changes in the physical structure and texture of snow	

			Changes in the depth of snow in areas with permanent snowcover	
			Changes in the length / duration of temporary snowcover	
			Changes in the extent of permanent snow	
		Lake and river ice	Changes in the physical structure and texture of ice in lakes or rivers	
			Changes in the thickness of ice in lakes or rivers	
			Changes in ice melting or breaking patterns in lakes or rivers	
		Sea Ice	Changes in the extent of sea-ice surface	
			Changes in the thickness of sea-ice	
		Glaciers and icebergs	Changes in the extension of glaciers	
			Changes in the extension of icebergs	
			Changes in the movement of icebergs	
		Permafrost	Changes in the extent of permafrost surface	
			Changes in the continuity of permafrost surface	
			Changes in the depth of the permafrost layer	
			Changes in the thawing or melting of permafrost	
		Seasonal ice formation	Changes in the speed of ice melting or break-up	
			Changes in the speed of ice formation	
			Changes in the timing of ice melting or break-up	
			Changes in the timing of ice formation	
			Changes in the frequency of freeze events	
			Changes in the duration of ice	
			Changes in ice stability / resistence	
Biological system	Marine Biological system	Marine spp Abundance	Changes in the abundance of marine animals excluding fish (mammals, birds, crustaceans, etc)	
			Changes in the abundance of marine algae-seagrass	
			Changes in the abundance of marine fish	

	Marine spp composition (assemblage of species)	Changes in the species composition of marine animal and plant species	´Species composition´ is the assemblage of species that is present in a given place, taking into account the identity and the number of individuals of each species.
	Marine spp Marine spp Distribution and migration	Changes in the distribution of marine animal and plant species	
		Changes in the location of animal marine species migration areas and routes	
	Marine spp Invasive Allien Species	Changes in the abundance or occurrence of marine animal and plant species stated as invasive	
	Marine spp Disease/pest/mortality	Changes in the size of marine animals and plants	
		Changes in the frequency of malformations in marine animals and plants	
		Changes in coral reef bleaching	
		Changes in the frequency of parasites in marine animal species	
		Changes in the mortality of marine animal and plant species	
	Marine spp Phenology	Changes in the behaviour of marine animals	´Phenology´ refers to cyclic and seasonal phenomena, such as reproductive and migration cycles
		Changes in the timing of migration of marine animal species	
		Changes in the timing of mating or reproduction of marine animal species	
	Marine spp Reproduction	Changes in the number of eggs, pups or offspring of marine species	
	Marine spp quality	Changes in the taste of marine animal and plant species	
Freshwater Biological system	Fresh water spp Abundance	Changes in the abundance of freshwater animal species, excluding fish (mammals, birds, amphibians, reptiles, crustaceans, etc)	
		Changes in the abundance of freshwater plant species	

		Changes in the abundance of freshwater fish	
	Fresh water spp Composition	Change in the species composition of freshwater animal and plant species	´Species composition´ is the assemblage of species that is present in a given place, taking into account the identity and the number of individuals of each species.
	Fresh water spp distribution and migration	Changes in the distribution of freshwater animal and plant species	
		Changes in freshwater animal species migration areas and routes	
	Fresh water spp Invasive Allien Species	Changes in the abundance or occurrence of freshwater animal and plant species stated as invasive	
	Fresh water spp Disease/pest/mortality	Changes in the size of freshwater animal and plant species	
		Changes in the frequency of diseases in freshwater animal and plant species	
		Changes in the frequency of malformations in freshwater animal and plant species	
		Changes in the frequency of parasites in freshwater animal species	
		Changes in the mortality of freshwater animal and plant species	
	Fresh water spp Phenology	Changes in the behaviour of freshwater animals	´Phenology´ refers to cyclic and seasonal phenomena, such as reproductive and migration cycles
		Changes in the timing of migration of freshwater animal species	
		Changes in the timing of mating or reproduction of freshwater animal species	
	Fresh water spp Reproduction	Changes in the number of eggs, pups or offspring of freshwater species	
	Fresh water spp quality	Changes in the taste of freshwater animal and plant species	

Terrestrial Wild Fauna	Terrestrial fauna Abundance	Changes in the abundance of terrestrial fauna (mammals, birds, reptiles, insects, etc)	
	Terrestrial fauna spp composition (assemblage of species)	Changes in the species composition of terrestrial fauna	´Species composition´ is the assemblage of species that is present in a given place, taking into account the identity and the number of individuals of each species.
	Terrestrial fauna spp Distribution and migration	Changes in the distribution of terrestrial fauna	
		Changes in terrestrial fauna migration areas and routes	
	Terrestrial fauna Invasive Allien Species	Changes in the abundance or occurrence of terrestrial fauna stated as invasive (cockroaches, rats, pidgeons, etc)	
	Terrestrial fauna Disease/pest/mortality	Changes in the size of terrestrial fauna	
		Changes in the frequency of diseases in terrestrial fauna	
		Changes in the frequency of animal pest-vector borne diseases (flies, ticks, etc)	
		Changes in the frequency of malformations in terrestrial fauna	
		Changes in the mortality of terrestrial fauna	
	Terrestrial fauna Phenology	Changes in the occurrence of unusual behaviour of terrestrial fauna	´Phenology´ refers to cyclic and seasonal phenomena, such as reproductive and migration cycles
		Changes in the timing of migration of terrestrial fauna	
		Changes in the timing of mating, reproduction or hibernation of terrestrial fauna	
		Changes in the behaviour of insects	
	Terrestrial fauna Reproduction	Changes in the number of eggs, pups or offspring of terrestrial fauna	
	Terrestrial game spp quality	Changes in the taste of terrestrial fauna	

Terrestrial Wild Flora	Wild flora abundance	Changes in the abundance or density of wild plant or fungi species	
	Wild flora species composition (assemblage of species) and vegetation characteristics	Changes in the species composition of vegetation	Changes in the species assemblage within a certain vegetation type (e.g., forests now have different tree species). ´Species composition´ is the assemblage of species that is present in a given place, taking into account the identity and the number of individuals of each species.
		Changes in the type of vegetation	Changes from one vegetation type to another (e.g., "forest to grassland"; "now the bamboo forest occurs only in higher elevations")
		Changes in vegetation height	
	Wild flora Distribution (fungi-plants-shrubs-trees)	Changes in the distribution of wild plant or fungi species	
	Wild flora Invasive alien Species (fungi-plants-shrubs-trees)	Changes in the abundance of wild plant or fungi species stated as invasive	
		Changes in the distribution of wild plant or fungi species stated as invasive	
	Wild flora Disease/pest/mortality (fungi-plants-shrubs-trees)	Changes in the occurrence of diseases/pests in wild flora	
		Changes in wild plant or fungi species mortality	
	Wild flora Phenology (fungi-plants-shrubs-trees)	Changes in wild plant species flowering time	´Phenology´ refers to cyclic and seasonal phenomena, such as reproductive and migration cycles
		Changes in wild plant or fungi species fruiting time	
		Changes in wild plant species´ timing of leaf shedding or growing new leaves	

		Changes in wild plant species ´behaviour´	´Behaviour´ refers to the manifestation of specific biological or physiological phenomena. For example, ´species x used to wither the leaves in the afternoon, now it does it in the morning´, or ´the tree Y used to produce droplets of water in the leaves during the night, now not anymore´
	Wild flora Productivity and Quality	Changes in the height of individuals of wild plant or fungi species	
		Changes in the growth rate of wild plant or fungi species	
		Change in the productivity of wild plant or fungi species (without further specification)	´Productivity´ means the rate of output per unit of input. Choose this option when the observation indicates that the system is producing less in general, without further specification. If the observation specifically mentions plant height, growth rate or size of plant parts, choose another option in this subsystem.
		Changes in the size of plant parts of wild plant species	
		Changes in the taste of wild plant or fungi species	
		Changes in the quality of wild plant or fungi species (not further specified)	
Land cover change & land degradation	Habitat / Landscape / Ecosystem	Changes in habitat integrity (not further specified)	
		Changes in land cover (not further specified)	
		Changes in biodiversity (not further specified)	
		Changes in ecosystem productivity (not further specified)	´Productivity´ means the rate of output per unit of input. Choose this option when the observation indicates that the system is producing less in general, without further specification.
		Changes in the availability / loss of specific landscape elements (not further specified)	
		Changes in the level of habitat fragmentation (not further specified)	
		Changes in wildfire frequency	

		Wildfires	Changes in intensity of wildfires	
			Changes in the scale / extension of wildfires	
Human system	Aquaculture (marine and fresh water)	Aquaculture productivity and quality	Changes in productivity in aquaculture (not further specified)	´Productivity´ means the rate of output per unit of input. Choose this option when the observation indicates that the system is producing less in general, without further specification. If the observation specifically mentions size, choose another option in this subsystem.
			Changes in size of animals in aquaculture	
			Changes in taste of animals in aquaculture	
		Aquaculture Disease/pest/mortality	Changes in frequency of animal disease in aquaculture	
			Changes in the frequency of malformations in animals in aquaculture	
			Changes in the frequency of parasites in aquaculture	
			Changes in mortality rates in aquaculture	
		Aquaculture Phenology and reproduction	Changes in the occurrence or frequency of unusual animal behavior in aquaculture	´Phenology´ refers to cyclic and seasonal phenomena, such as reproductive and migration cycles
			Changes in the time of mating or reproduction in aquaculture	
			Changes in the number of eggs, pups or offspring in aquaculture	
	Cultivated plant spp (crops, orchards)	Cultivated spp productivity and quality	Changes in crop productivity / yield	´Productivity´ means the rate of output per unit of input. Choose this option when the observation indicates that the system is producing less in general, without further specification. If the observation specifically mentions size, choose another option in this subsystem.
			Changes in cultivated species´ fruit size	
			Changes in the taste of crop species / products	
			Changes in the quality of crop species / products (not further specified)	
			Changes in the frequency of successful cropping seasons	

		Changes in crop growing patterns / crop morphology	For example, ´the crop X used to branch much more in the past´, or ´the leaves of crop Y used to be more pointed´
	Seed or propagule availability or quality	Changes in the availability of crop seeds or propagules	
		Changes in the quality of crop seeds or propagules	
	Cultivated spp Disease/pest / mortality	Changes in the frequency of crop diseases (virus, fungi, bacteria, nematodes, etc)	Diseases are defined as alterations of the phisiology or morphology of the plants by the action of biotic or abiotic agents. Biotic agents of diseases may be fungi, bacteria, viruses or nematodes. Abiotic agents of disease may be climatic conditions, nutrient deficiency, etc.
		Changes in the frequency of crop ´pests´ (insects, birds, larvae, etc)	Pests are defined as the massive appearance of living beings of the same species that cause serious damage to animal or crop populations.
		Changes in crop mortality rates	
	Cultivated spp Weeds	Changes in the frequency or occurrence of weed species stated as invasive	Use this category specifically for species that occur in cropping systems and are considered invasive weeds
	Cultivated spp Phenology and reproduction	Changes in crop suitable cultivation areas	
		Changes in crop flowering time	´Phenology´ refers to cyclic and seasonal phenomena, such as reproductive and migration cycles
		Changes in crop fruiting time	
		Changes in crop maturation time	
		Changes in crop harvesting time	
		Changes in crop sowing / planting time	
		Changes in length of crop flowering time	
		Changes in length of crop fruiting time	
		Changes in length of crop maturation time	
		Changes in length of crop harvesting time	
		Changes in length of cropping "season" (not further specified)	
		Changes in pasture cover, surface or abundance	

Pastures and grasslands	Pasture availability and productivity	Changes in pasture productivity	´Productivity´ means the rate of output per unit of input. Choose this option when the observation indicates that the system is producing less, without further specification. If the observation specifically mentions pasture growth rate, choose another option in this subsystem.
		Changes in pasture species´ growth rate	
	Pasture spp composition, distribution and quality	Changes in the abundance of specific pasture species	
		Changes in the species composition of pastures	´Species composition´ is the assemblage of species that is present in a given place, taking into account the identity and the number of individuals of each species.
		Changes in the quality of pasture (without further specification)	
		Changes in the number of specific pasture species	
	Pasture Disease/pest/mortality	Changes in the frequency of diseases in pasture species	Diseases are defined as alterations of the phisiology or morphology of the plants by the action of biotic or abiotic agents.
		Changes in the frequency of ´pests´ in pasture species (insects, larvae, etc)	Pests are defined as the massive appearance of living beings of the same species that cause serious damage to animal or crop populations
		Changes in pasture mortality rates	
	Pasture weeds	Changes in the frequency or occurrence of species stated as invasive in pastures	Use this category specifically for species that occur in pastures and are considered invasive
		Changes in the abundance of plant species in pastures that are toxic or unpalatable for livestock	Use this category specifically for species that occur in pastures and are considered toxic /unpalatable
	Pasture Phenology and reproduction	Changes in pasture species´ timing of vegetative growth	´Phenology´ refers to cyclic and seasonal phenomena, such as reproductive and migration cycles
		Changes in pasture species´ timing of reproduction	
		Changes in pasture seed availability	
Livestock	Livestock productivity and quality	Changes in livestock productivity (eg., milk, meat, wool)	´Productivity´ means the rate of output per unit of input. Choose this option when the observation indicates that the system is producing less in general, without further specification.

			Changes in the milking period of livestock	
		Livestock disease/pest/mortality	Changes in the frequency of livestock disease	
			Changes in livestock mortality	
			Changes in the frequency of livestock pest-vector borne diseases (flies, ticks, etc)	
			Changes in the frequency of parasites in livestock	
		Livestock phenology and reproduction	Changes in the frequency of livestock mating	
			Changes in the timing of livestock mating or reproduction	
			Changes in the number of pups or offspring in livestock	
			Changes in livestock behaviour	
	Human health	Diseases	Changes in the incidence of human diseases (flu, allergies, etc)	
			Change in the incidence of human vector borne diseases (malaria, dengue, etc)	
			Change in the incidence of human waterborne diseases	Waterborne diseases are those diseases caused by drinking contaminated or dirty water
		Heatlh injuries, physical affection	Changes in the incidence of human health injuries (eg., ice-related accidents, weather inclemency, walking longer distances to water)	
		Hunger	Changes in the frequency of famine / food shortage episodes	
			Changes in the number of people affected by hunger	
		Conflicts	Changes in the frequency of conflicts over natural resources	
		Cultural/Spiritual/ Identity values	Changes in cultural-identity-spiritual values	
	Infrastructure	Transport (e.g. trails)	Changes in frequency of problems with transportation	
	Other	Other	Changes in solar movement	

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LICCI

Local Indicators of Climate Change Impacts

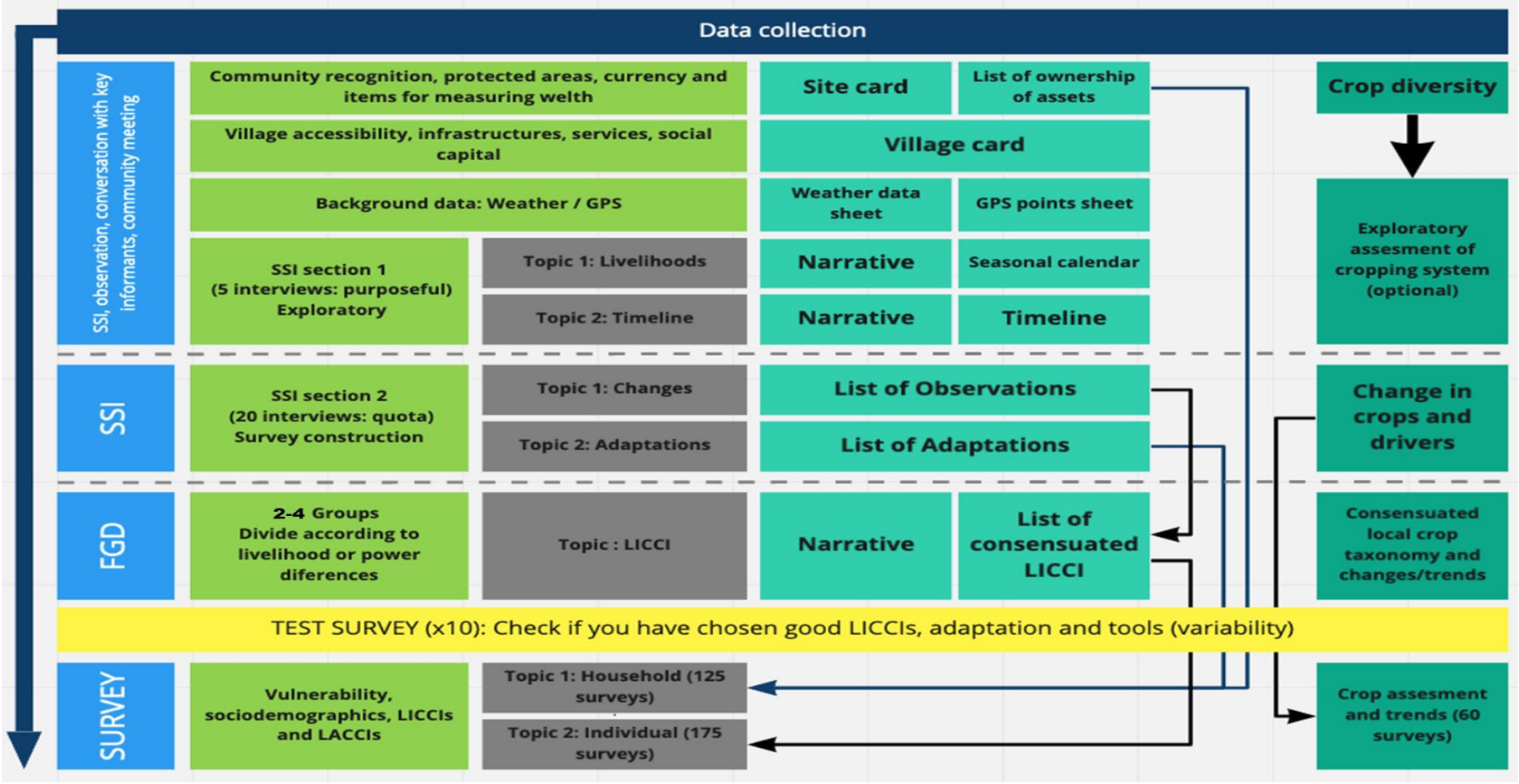
Output Manual

Preliminary Note

This Output Manual serves as a data collection tool for background and qualitative data and as an alternative in case you cannot use the App to conduct the surveys in the field. Note that the App is not meant to be used as an “on the go” data collection tool for the SSI or FGD, but rather as a tool to transfer the synthesized outputs of the exploratory and qualitative data collection.

All data collected should be systematically submitted either via the App or via the excel files (for those who cannot use the App for a justified reason). Data will be then sent to the data repository (check technical manual).

List of deliverables



Output Formats:

App exports (alternative excel files):

- Site card
- Ownership of assets with a market value
- Village cards
- Seasonal calendar
- Local timeline
- SSI list of observed changes
- SSI list of adaptations
- FGD validated LICCIs
- Household surveys (second checkpoint)
- Individual surveys (second checkpoint)

Excel files (sent via ProjectSend):

- weather data (raw format & provided excel template)
- (GPS point data)

Word documents (sent via ProjectSend):

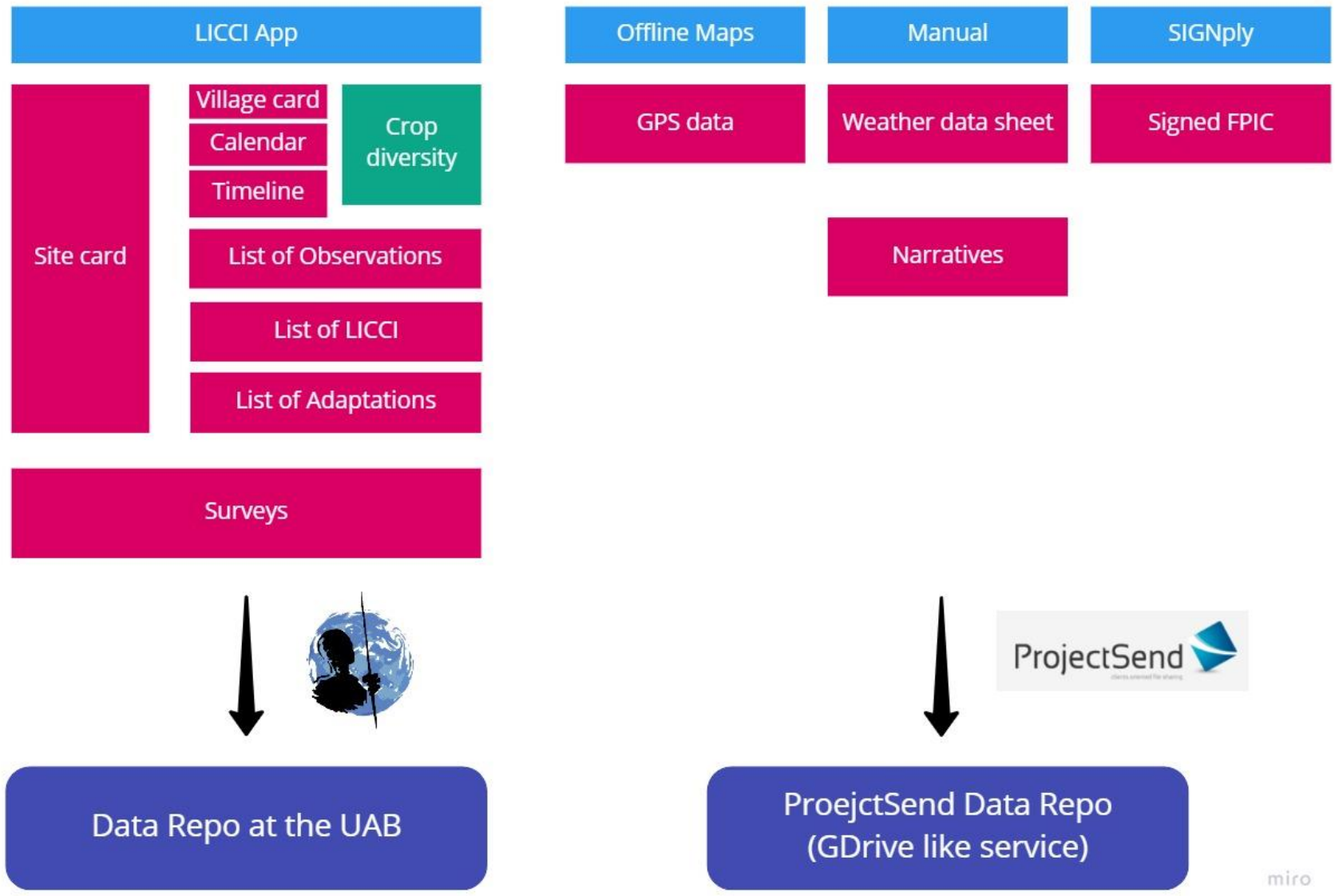
- Weather station questionnaire
- SSI narratives (1 page per topic)
- FGD narratives (1 page per group)

GPX files (sent via ProjectSend):

- GPS data (see also the Technical Manual)

SIGNPLY (sent via ProjectSend)

- Signed FPIC forms


LICCI App
Site card
Village card
Calendar
Timeline
Crop diversity
List of Observations
List of LICCI
List of Adaptations
Surveys
Offline Maps
GPS data
Manual
Weather data sheet
Narratives
SIGNply
Signed FPIC
ProjectSend
Data Repo at the UAB
ProejctSend Data Repo
(GDrive like service)
miro

SITE CARD

Variable	Question	Format	Response
Site ID	Site ID. Unique site identification number	Pos. Number	
Site name	Site name	Text	
Country	Country	Text	
Local currency name	What is the name of the local currency?	Text	
Local currency value	What is the exchange rate of the local currency to US Dollars? Get the value of the local currency from www.oanda.com. Local currency value (1USD = x local).	pos. Number	
Currency value date	Currency value date: Date when the exchange rate was checked	dd/mm/yyyy	
IPLC name	IPLC: Name of the indigenous group you are working with. If it's a local community not identified as a specific ethnic group, give your best description, e.g. rural/isolated fishing community in XXX area.	Text	
Protected area in site	Is there any protected area in your site?	Select: Yes or No	
Protected area ID	Protected area ID. Unique Protected area identification number	List: pos. Number	
Protected area name	What is the name of the protected area? Note: If the protected area has changed its protection status, but both status are active (e.g., changing from State Park to National Park, but both status are recognized), please include all of them as different protected areas.	List: Text	
Protected area declaration year	When (year) the status of protected area was declared?	List: pos. Number	
Recognized territory in site	Is the IPLC an officially recognized territory? (communal)	Select: Yes or No	

Recognized territory ID	Recognized territory ID. Unique recognized territory identification number	List: pos. Number	
Recognized territory name	What is the official name of the IPLC recognized territory?	List: Text	
Recognized territory year	When (year) the territory was officially recognized?	List: pos. Number	

OWNERSHIP OF ASSETS WITH A MARKET VALUE

Include manufactured items purchased in the market and/or self-made items with substantial market/retail value (e.g., canoes). List 15 assets (e.g., hoe, machete, fishing net, cookware, clock, phone), and as many livestock species as necessary (e.g. animals as a source of food such as cow and goat, transport animals such as horse and camel, and animals as a farming tool such as ox and elephant). Give the average price of the items in local currency.

Site ID	Item ID	Item name	Market value
Pos. Number	(Fixed)	(Text)	(Pos.Number: unit local currency)
	Asset 1		
	Asset 2		
	Asset 3		
	Asset 4		
	Asset 5		
	Asset 6		
	Asset 7		
	Asset 8		
	Asset 9		
	Asset 10		
	Asset 11		
	Asset 12		
	Asset 13		
	Asset 14		
	Asset 15		
	Livestock species1		
	Livestock species2		
	Livestock species3		

	Livestock species4		
	Livestock species5		

VILLAGE CARD (3-5 per site)

1. General Village Data

General village data			
Variable	**Question**	**Response format**	**Response**
Site ID	Site ID: Unique site identification number	pos. Number	
Village ID	Village ID: Unique village identification number	pos. Number	
Village name	Village name	Text	
Village household number	Total number of households in the village: How many households does the village have?	pos. Number: min: 20	
Administrative center	Name of the closest administrative center of the village.	Text	
Same place	Are the administrative center and the market town the same place?	Select: Yes or No	
Market town	Name of the closest market town, where people go to buy/sell products	Text	
Special protected area	Is this village located within an area under special protection?	Select: protection: No, Yes - inside a protected area, Yes - located within an officially recognized territory, Yes - located within both a protected area and an officially recognized territory	

2. Village Accessibility Data

Village accessibility from Administrative center					
** *Is the accessibility during the two main seasons largely the same?*					
Variable	**Access**	**Access time**	**Access cost**	**Means of transport**	**Access frequency**
Response format	Select: Yes or No	Non.neg. Number: unit hours	Non.Neg. Number: unit: local currency	Select multiple: transport type: foot, car, bus, train, boat, plane, other (text)	Select: transport frequency: hourly, daily, weekly, monthly
Easy season - most common way					
Easy season – alternative way					
Hard season –most common way					

Hard season – alternative way					

Village accessibility from Market town					
** *Is the accessibility during the two main seasons largely the same?*					
Variable	**Access**	**Access time**	**Access cost**	**Means of transport**	**Access frequency**
Response format	Select: Yes or No	Non.Neg. Number: unit hours	Non.neg. Number: unit: local currency	Select multiple: transport type: foot, car, bus, train, boat, plane, other (text)	Select: transport frequency: hourly, daily, weekly, monthly
Easy season - most common way					
Easy season – alternative way					
Hard season –most common way					
Hard season – alternative way					

3. Village Infrastructure Data

Village infrastructure data			
Variable	**Question**	**Response format**	**Response**
Site ID		Pos. Number	
Village ID		Pos. Number	
Village electricity	Is there any form of electricity coverage in the village?	Select: Yes or No	
Approximately, how many households in the village have electricity from…(households having energy from different sources must be included in all categories)			
Village electricity grid	from the grid?	Non.Neg. Number: unit % of households	
Village electricity generator	with electricity generator?	Non.Neg. Number: unit % of households	
Village electricity solar	from solar panels?	Non.Neg. Number: unit % of households	
Village electricity other	from other sources	Non.Neg. Number: unit % of households	
Approximately, how many households in the village obtain water from... (households obtaining water from different sources must be included in all categories)			
Village water well	the well?	Non.Neg. Number: unit % of households	
Village water river	the river?	Non.Neg. Number: unit % of households	
Village water rain	the rain?	Non.Neg. Number: unit % of households	
Village water pipe	the pipe	Non.Neg. Number: unit % of households	
Village water other	Other sources	Non.Neg. Number: unit % of households	
Village radio access	Is there radio access in the village?	Select: radioaccess: No radio, Receiver (radio), Receiver (Smart devices: phone, tablet, pc),	

		Transmitter, Both receiver and transmitter	
Village TV access	Is there TV access in the village?	Select: TV access: No TV, TV in nearby village, TV in this village, TV through smart devices (phone, tablet, pc)	
Village phone coverage	Is there phone coverage in this village?	Select: phone coverage: No phone, Landline, Mobile phone only for calls, Mobile phone internet and calls	
Village government worker	Are there any government officials living in the village?	Select: Yes or No	

4. Village Service Data

Village services data			
Variable	**Question**	**Response format**	**Response**
Site ID		Pos. Number	
Village ID		Pos. Number	
Village access to school primary	Where do people in the village have access to primary school?	Select: level of access: no access, access within the village, access in a nearby village, access in the market town, access in the administrative center, other	
Village access to school secondary	Where do people in the village have access to secondary school? (education after primary school and before university)	Select: level of access	
Village access to school beyond secondary	Where do people in the village have access to school beyond secondary?	Select: level of access	
Village health healer	Where do people in the village have access traditional healer	Select: level of access	
Village health worker	Where do people in the village have access health worker?	Select: level of access	
Village health post	Where do people in the village have access a health post?	Select: level of access	

Village hospital	Where do people in the village have access to a hospital?	Select: level of access	
Village shop basic	Where do people in the village have access to buy basic groceries and items? (e.g., sugar, machete)	Select: level of access	
Village shop special	Where do people in the village have access to buy special goods? (e.g., TV, chainsaw)	Select: level of access	
Village sell harvest	Where do people in the village have access to sell their harvest?	Select: level of access	

5. Village Social Capital Data

Village social capital data (general)			
Variable	**Question**	**Response Format**	**Response**
Site ID		Pos. Number	
Village ID		Pos. Number	
Group cohesion	In case an extreme event affects the whole community, who do you think would come forward to deal with this situation?	Number: min.: 1; max.: 5; (1) everyone would deal with the problem individually (5) the entire village would act together	
Group solidarity	In case a person/household in the village faces an emergency, how would people in the village react? (e.g., big crop loss, illness etc.)	Number: min.: 1; max.: 5; (1) no one would do anything (5) everyone from the village would help them	
Group care	Who looks after the common land and common spaces in the village?	Number: min.: 1; max.: 5; (1) no one does anything (5) the entire village discusses and decides what needs to be done	
Group trust	In this village, do people trust each other?	Number: min.: 1; max.: 5; (1) people only trust their family and kin (5) people trust each other	
Group change	Compared to 15 years ago, do you think people now are engaged in social/collective activities more or less?	Select: people engagement: engagement decreased; engagement remained the same; engagement increased	
Note: The 1-5 scale does not need to be directly presented to the interviewee, but instead using it as a guideline to code the answers that might be purely qualitative / textual. There is no specific description assigned to each category (1-5) as we acknowledge the scale is context-specific.			

Village social capital data (formal groups)			
Variable	**Question**	**Response format**	**Response**

Site ID		Pos. Number								
Village ID		Pos. Number								
			Formal groups related to...							
Group type			Productive activities	Cultural activities	Spiritual or religious activities	Political activities	Nature conservation activities	Sport activities	NGOs	Other
Group number	How many **formal groups** conducting the following activities are there in the village?	Non.Neg. Number								
Group frequency	On average, how often do these formal groups meet?	Number: min.: 1; max.: 5; (1) not often (5) very often								
Group participation	On average, how would you assess the level of participation of villagers in these groups?	Number: min.: 1; max.: 5; (1) almost no one in the village participates (5) almost everyone in the village participates								
Note: “Formal group” refers to people follow formal relationships, rules, and policies, and groups are established for compliance. Moreover, there exists a system of authority.										

SEMI STRUCTURED INTERVIEWS – SECTION 1 (x5) – Output is aggregated from all interviews

Question	Description	Response Format	Response
Explore activities people do for a living in the community	Site's seasonal calendar. It can be circular or linear calendar, structured by season or by month, whichever fits better the local worldview. **Creative approaches are recommended (e.g., drawings). However, the data need to be submitted in the format described in the csv (or via the App).**	Use App or check the csv	
Explore the schedule of livelihood activities (yearly, seasonally)			
Explore the location where livelihood activities take place			
Explore household members or community groups in charge of livelihood activities.			
Explore variations of ILK regarding livelihood activities within the society.			
Explore the history of the study site.	Site's timeline covers the past 80-100 years. Use 20-year periods based on lifelines (childhood, adulthood, seniority, etc.), and/or linked to personal life events (school, marriage, first child, first grandchild, etc.) if you know the birth year of the respondent. **Creative approaches are recommended (e.g., drawings). However, the data need to be submitted in the**	Use App or check the csv	
Explore important events in the community that everyone remembers.			
Explore when these important events happened			

	format described in the csv (or via the App).		
Livelihood narrative	Narratives summarizing the main issues learned from each topic (local livelihoods and timeline). This narrative should include a paragraph or two to describe the sample and interview procedure (e.g., description of when the interviews took place - season/calendar, number of people interviewed, age, gender, etc.). This information should help interpret information.	text (approx. 1 page per topic=2pages=1000 words)	
Timeline narrative			

SEMI STRUCTURED INTERVIEWS – SECTION 2 (x20) - Output is aggregated from all interviews

List of observed changes				
Change Observation ID	**Observation** (Observed changes)	**Drivers** (can also be LICCI)	**Observation perceived as climate change -related**	**Number of interviewees mentioned it**
	Textual answer given by informant	List: Select multiple: tree of LICCI, other (text)	Select: climate change relation: not related to climate change, only local people relate it to climate change, only researcher relates it to climate change, clearly related to climate change/both researcher and local people relate it to climate change*	Non.neg number
	Observation 1			
	Observation 2			
	…			

Change Observation ID	**Observation** (Observed changes)	**Drivers** (can also be LICCI)	**Observation perceived as climate change -related**	**Number of interviewees mentioned it**

Change Observation ID	**Observation** (Observed changes)	**Drivers** (can also be LICCI)	**Observation perceived as climate change -related**	**Number of interviewees mentioned it**

Date of change: November 27, 2019 (before: select: not climate-related, people related it to climate change, only researcher related it to climate change)

Comment: The adaptation/coping tree is available in the 'Deliverables CSV - First-Checkpoint'.

Change observation ID (From table above)	**Adaptation/coping measure** (from SSI & observation)	**Adaptation/coping agent** (who does the measure)	**Adaptation/coping category** (in cooperation with LICCI core team)	**Direction of adaptation/coping category**	**Since when**	**Coping or adaptation** (with brief justification)	**Number of interviewees that mentioned it**
List: select multiple: positive number	Text: Description given by informant	Select: adapt agent: individual, household, (whole) community, NGO, government, other (text)	Select multiple: tree of adaptation/coping categories, other (text)	select: adaptdirection: start, increase/more, reduce/less, stop, higher, lower, earlier, later, shift, switch/replace/substitute, diversify, relocate, no direction, other (text)	Select: when adapted: past year, past 10 years, past 20years, more than 20 years ago	List: text	Non.neg number
	Adaptation/Coping 1						
	Adaptation/Coping 2						
	…						

Change observation ID (From table above)	**Adaptation/coping measure** (from SSI & observation)	**Adaptation/coping agent** (who does the measure)	**Adaptation/coping category** (in cooperation with LICCI core team)	**Direction of adaptation/coping category**	**Since when**	**Coping or adaptation** (with brief justification)	**Number of interviewees that mentioned it**

Change observation ID (From table above)	**Adaptation/coping measure** (from SSI & observation)	**Adaptation/coping agent** (who does the measure)	**Adaptation/coping category** (in cooperation with LICCI core team)	**Direction of adaptation/coping category**	**Since when**	**Coping or adaptation** (with brief justification)	**Number of interviewees that mentioned it**

FOCUS GROUP DISCUSSIONS (x2-4) – Output is for each focus group discussion

1. Text summary of discussion on drivers (what people think drives the observed changes) and timing (when the changes happened) (one for each FGD).

2. Text summary of how FGD is proceeded (one for each FGD).

Observed Changes (From SSI compilation)	**Level of agreement**[1] (Observation in FGD)	**LICCI**	**Directions**	**Species** (Optional)	**Life forms**	**Uses of species and/or parts**
	Select: fgd agreement: Disagreed, Disagreed after debate, Agreed after debate, Fully agreed	Select multiple: from LICCI tree, other (text)	select multiple: change direction: appearance, increase, more, higher, longer, later, stronger, faster, decrease, less, lower, shorter, sooner, weaker, slower, disappearance, other (text)	Text	Select multiple: fungi, non-woody plant, woody plant, vertebrate, invertebrate	Select multiple: food, medicine, animal food, timber, materials (construction, tools, firewood, etc.), sociocultural uses (religious, decoration etc.), commercialization, others
Observation 1						
Observation 2						

[1] Only select "agreed" if the FGD agrees on all three aspects: 1) the observation, 2) the direction of the observation and 3) observation driven by climate change.

Observed Changes (From SSI compilation)	**Level of agreement** (Observation in FGD)	**LICCI**	**Directions**	**Species** (Optional)	**Life forms**	**Uses of species and/or parts**

Observed Changes (From SSI compilation)	**Level of agreement** (Observation in FGD)	**LICCI**	**Directions**	**Species** (Optional)	**Life forms**	**Uses of species and/or parts**

Observed Changes (From SSI compilation)	**Level of agreement** (Observation in FGD)	**LICCI**	**Directions**	**Species** (Optional)	**Life forms**	**Uses of species and/or parts**