



Food and Agriculture
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SELF-EVALUATION AND HOLISTIC ASSESSMENT OF CLIMATE RESILIENCE OF FARMERS AND PASTORALISTS (SHARP+)

A NEW GUIDANCE DOCUMENT
FOR PRACTITIONERS



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by

Maria Hernández Lagana

International consultant

Suzanne Philips and Anne Sophie Poisot

Food and Agriculture Organization of the United Nations

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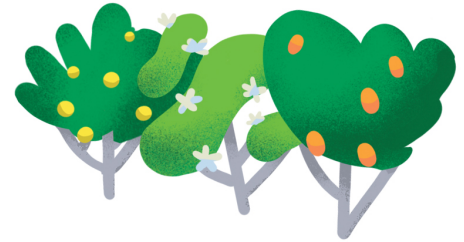
Abbreviations and acronyms

BRACED	Building Resilience and Adaptation to Climate Extremes and Disasters
CSA	Climate-smart agriculture
DSL-IP	Dryland Sustainable Landscapes Impact Programme
ETF	Enhanced Transparency Framework
ETH-Zürich	Swiss Federal Institute of Technology in Zürich
FAO	Food and Agriculture Organization of the United Nations
FFL	Food for Life
FFS	Farmer field school
FIES	Food insecurity experience scale
GEF	Global Environment Facility
ICT	Information and communication technology
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IFRI	International Forestry Resource and Institutions
IPCC	Intergovernmental Panel on Climate Change
LADA	Land Degradation Assessment in Drylands
LDCF	Least Developed Countries Fund
LSMS	Living Standards Measurement Study
M&E	Monitoring and evaluation
MPAT	Multidimensional Poverty Assessment Tool
NGO	Non-governmental organization
ODI	Overseas Development Institute
RFS	Resilient Food Systems
SAFA	Sustainability assessment of food and agriculture systems
SDG	Sustainable Development Goal
SES	Social-ecological system

SHARP	Self-evaluation and Holistic Assessment of climate Resilience of farmers and Pastoralists
STAP	Scientific and Technical Advisory Panel
TOC	Theory of change
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
WEIA	Women's Empowerment in Agriculture index

1

Introduction



1.1 What is SHARP+?

The Self-evaluation and Holistic Assessment of climate Resilience of farmers and Pastoralists (SHARP+) tool assesses household climate resilience based on the knowledge and priorities of farmers¹ using an integrated approach. The first version of the tool was initially developed in 2014 in a collaborative manner by the Plant Production and Protection Division (NSP, former AGP) of the Food and Agriculture Organization of the United Nations (FAO) and external partners.

The assessment follows Cabell and Oelofse’s 13 agro-ecosystem indicators of resilience (Cabell and Oelofse, 2012) and it is based on a set of questions covering social, economic, environmental and agronomic aspects of rural-based livelihoods.

SHARP+ also comprises qualitative components through which respondents have the opportunity to state the adequacy status and the importance levels of the various aspects of their livelihoods. These components aim to explore farmers’ perceptions, behaviours and priorities to enhance their resilience and food security.

The assessment is operationalized in the field via an offline tablet-based questionnaire. Through it, the quantitative and qualitative answers are transformed into numerical scores reflecting the resilience levels of rural households, as well as the priority areas as considered by farmers.

Monitoring changes in SHARP+ scores at different points in time reveals whether household resilience is declining or improving, as well as how and if farmers’ priorities have changed over time. The comprehensive and holistic nature of the information collected through SHARP+ also

¹ When presented alone, the term “farmers” refers to producers involved in crop, livestock and forest production.

supports the analysis and identification of the contributing factors of changes in resilience levels at different points in time.

1.2 From SHARP to SHARP+: key developments and implementation in the field

When initially developed in 2014, SHARP was conceived as a tool to conduct rapid resilience assessments of rural households and farm systems with respect to climate change and related shocks. The assessments aimed at enabling practitioners and farmers themselves to gain an increased understanding of rural livelihoods and to identify strategies that could be used to strengthen and build farmers' climate resilience. By doing the assessments, farmers would also have the opportunity to express their interests and concerns, and to prioritize specific components of their farm systems, households and communities that needed action, in order to improve their resilience status.

From 2015 to 2017, SHARP was implemented in 16 countries in sub-Saharan Africa, the Sahel, Latin America, Southeast Asia and Europe. The tool was primarily used to conduct diagnosis and needs assessment analyses as part of projects' monitoring activities, as well as for research in academia.

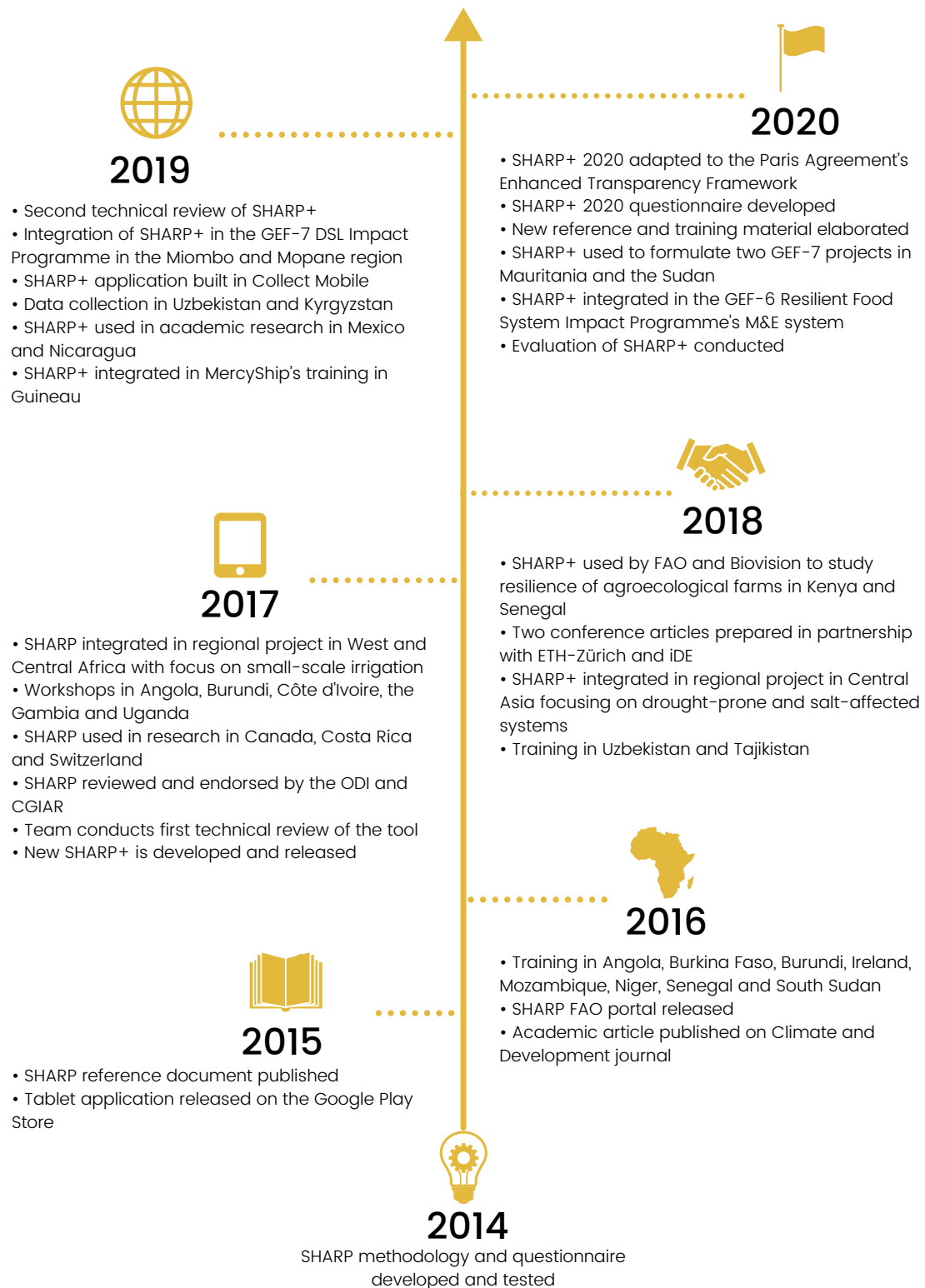
Important lessons were learned through the operationalization of SHARP in the field in the first two years. On the one hand, SHARP was deemed a very useful and informative tool for understanding rural households' livelihoods and resilience performance. This resulted very favourable to the formulation of projects with focus on rural and agricultural development, as there was often a lack of primary, up-to-date household-level data in the countries.

On the other hand, recurrent challenges for practitioners were also noted. These were mainly linked to the length of the questionnaire and the tablet application performance, reflected in high time demands for data collection. Despite being an open-source application, the use of SHARP by farmers themselves was scant, particularly in remote areas. This was due to low literacy levels and restricted access to information and communication technologies (ICT).

To respond to these challenges, the SHARP team conducted the first major technical review of the tool at the end of 2017 to address these concerns and improve the accuracy of the assessment and overall users' experience. The team benefited from feedback from technical units within FAO and research institutions to conduct the review. Suggestions from facilitators, enumerators and research associates in the field also aided the tool improvement.



Figure 1. Timeline of key developments and implementation of SHARP and SHARP+

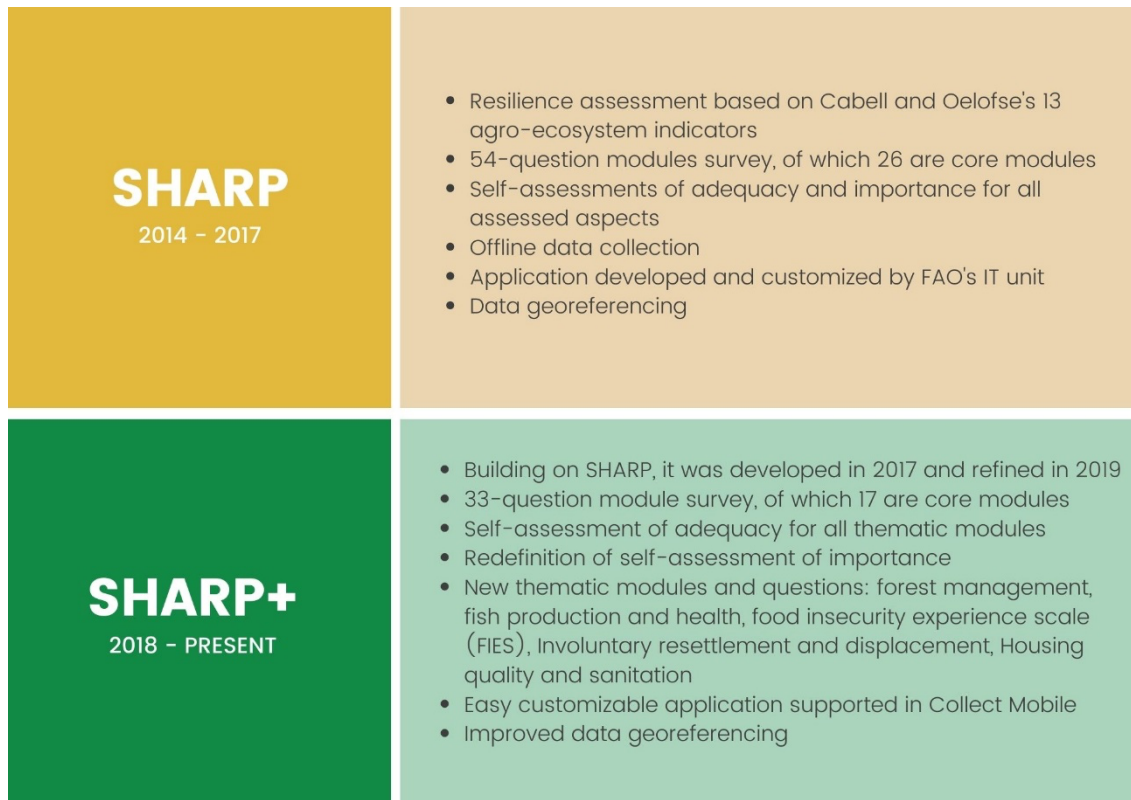


Notes: CGIAR – CGIAR System Organization; DSL – Drylands Sustainable Landscape; ETH-Zürich – Swiss Federal Institute of Technology in Zürich; FAO – Food and Agriculture Organization of the United Nations; GEF – Global Environment Facility; M&E – monitoring and evaluation; ODI – Overseas Development Institute.

This first technical revision centred on addressing the methodological and technological drawbacks of SHARP and of the tablet application. With the support of FAO’s NSP division, the SHARP team developed **SHARP+** – a shortened version of the SHARP questionnaire with an improved, more robust scoring system. A new Android-based tablet application was also developed.

In 2019, with the new Global Environment Facility (GEF) programmatic framework – GEF-7, SHARP+ underwent a second technical review. This aimed at improving SHARP+’s suitability to be used in the context of sustainable landscape management, while addressing key socioeconomic aspects, such as poverty and food insecurity. Other features related to the monitoring of specific Sustainable Development Goal (SDG) indicators were also incorporated as part of the survey. The second technical review conducted in 2019 resulted in an improved version of the SHARP+ questionnaire, as well as in a new tablet and phone-based application using the Open Foris tool, Collect Mobile. The new questionnaire and application enhanced the data collection experience, reduced time for survey customization and improved the connection of results with earth observation satellite imagery. In 2021, the survey has been redirected and is now available on KoBoToolbox, in addition to Open Foris.

Figure 2. What’s new in SHARP+?





1.3 A new guidance document for practitioners



SHARP+ field training in Yogyakarta, Indonesia © FAO/D. Colozza

This **new guidance document** provides updated guidelines and tools for development practitioners and researchers on the features and use of **SHARP+**, describing the tool as it is today. This document does not replace the previous “Self-evaluation and Holistic Assessment of climate Resilience of farmers and Pastoralists” methodological document published in 2015 ([Choptiany et al., 2015](#)) which encompasses all the theoretical grounds of the tool.

This guidance document also presents the latest version of the questionnaire, **SHARP+ 2020**, scoring system and tablet application based on the two technical reviews mentioned above. This document walks the reader through a step-by-step process to set up the **SHARP+** assessment, adapt it to the local context, and use it to collect and analyse information about household resilience in the context of climate change. The new material presented is for use by practitioners in the future implementation of SHARP+ in the field.

1.4 Where to start?

The handbook provides a wealth of information for practitioners to learn about the methodology, to learn how to conduct an assessment in the field and how to use the results for monitoring and evaluation (M&E) or research purposes. To this end, the links below can help the reader navigate the document.

Section

2

Section 2 offers an overview of the methodology and theoretical grounds of the tool, providing an overall picture of the evolution of SHARP and SHARP+ since their inception. It guides the reader through the technical reviews and the results of the evaluation of SHARP+ that helped build SHARP+ 2020.

Section

3

Section 3 presents the main features of SHARP+ as it is today. It outlines the goal and the theory of change (TOC), as well as the working definition of resilience ([subsection 3.3](#)) and principles ([subsection 3.4](#)) that SHARP+ uses. [Subsection 3.5](#) outlines the structure of question modules and [subsection 3.7](#) shows how resilience is calculated and farmers' priorities established for resilience building. The links to access the Android tablet application are found in [subsection 3.8](#).

[Annexes B](#) and [C](#) are complements to Section 3, presenting the latest questionnaire version, SHARP+ 2020 and scoring system.

Section

4

Section 4 offers guidance on how to use SHARP+ as an M&E tool. It provides insights on the nature of the information SHARP+ collects and presents examples on how the tool can be integrated in the M&E systems of projects. This includes the selection and definition of impact, outcome and output indicators based on the questions and collected information, as well as where and how to use it in the project cycle. The section also shows how SHARP+ is aligned with the 2030 Agenda.

Section

5

Section 5 contains relevant information on how to plan a SHARP+ assessment in the field. It provides a comprehensive step-by-step guide on how to adapt and customize the tool and what is needed to organize training for enumerators. The section also offers guidance on how to prepare the data collection activities and implement the data analysis and reporting processes. The time requirements when incorporating SHARP+ as part of the M&E system in a project are also presented.

[Annex D](#) complements Section 5, providing guidance documentation for use of SHARP+ in the field.

2

Overview of SHARP: the development of a methodology to assess resilience



This section walks the reader through the early developments of SHARP in 2014 and how it has evolved since. It also provides an overview of the methodology and theoretical grounds on which SHARP+ is based.

2.1 SHARP: initial need for a climate resilience assessment and monitoring tool

In 2014, as part of FAO's Plant Production and Protection Division's project work funded through the GEF, SHARP was developed because of the practical necessity of projects to assess farmers' climate resilience through knowledge exchange.

The information compiled through SHARP was also to be used to inform farmer field school (FFS) curricula and other field activities, as well as to create evidence to drive changes in national and local policies necessary to improve climate resilience (Choptiany *et al.*, 2015). A further objective of SHARP was to contribute to FAO's strategic objectives and be included in the work of major donors (e.g. GEF) or other ongoing initiatives both within and outside of FAO.

To ensure that SHARP responded to these needs effectively while not overlapping with existing tools for resilience assessment, in 2014 the SHARP team in partnership with the University of

Leeds, United Kingdom, conducted a gap analysis to identify, review and analyse existing resilience assessment methodologies, frameworks and approaches. The analysis (Choptiany *et al.*, 2015) revealed the following:

- There was a lack of tools that assess general resilience status and/or climate resilience specifically with a long-term development focus. At the time, most tools focused on risk reduction and hazards within an emergency, shock-responsive, short-term context.
- Existing tools conceptualized resilience as the antonym of vulnerability.
- There was a limited number of climate-related tools targeted at the household level. Existing tools focused on a community-level assessment (e.g. through group discussions) or used country-level secondary data (e.g. household and agricultural censuses) which are usually hard to get and often outdated.
- There was a scarcity of practical applicable tools to assess resilience in a rural context.
- The number of tools that integrated quantitative and qualitative data was scant.
- There was a restricted number of new tools that actually operationalized and translated the assessment results into strategies to strengthen resilience.

Therefore, despite the existence of some tools and methodologies, the analysis revealed the strong need for a simple, yet robust, self-assessment **tool targeted at the individual or household level**, and whose aggregated results would allow comparability between sites, communities and populations. It was desirable a tool that considered the **integration of quantitative and qualitative components** based on strong theoretical foundations to assess resilience and to identify priorities in an inclusive manner. The tool also needed to be expressly **designed for farm systems**, conceptualizing these as integrated social-ecological systems,² using an approach fostering the **notions of participation, learning, knowledge co-creation and empowerment of farmers and communities**.

This analysis formed the basis for the development of SHARP in 2014. These also became the underlying principles that have guided its implementation in the field ever since.

² Social-ecological systems are an ecological system intricately linked with and affected by one or more social systems (Anderies *et al.*, 2013). Berkes and Folke used the term "social-ecological", rather than "socioecological", because the former emphasizes that the two subsystems are equally important, whereas "socio-" is a modifier, implying a less than equal status of the social subsystem" (Berkes 2017, p. 3).



2.2 SHARP+: an improved tool based on lessons learned



Discussion and feedback on SHARP field training in Namibe, Angola © FAO/D. Colozza

Following initial testing in Burkina Faso and Uganda in 2015, SHARP had been incorporated in 16 field projects mainly in sub-Saharan Africa and the Sahel, as well as in research studies in Latin America and Europe by 2017. The rapid uptake of the tool and its wide implementation in different contexts allowed the identification of common advantages and challenges experienced by practitioners (Figure 3).

The feedback received – particularly regarding the challenges – motivated the first major technical review of the tool at the end of 2017.³ The review aimed to improve the content and performance of the tool to make it more suitable and user-friendly to practitioners, while reducing the burden for farmers to take a long survey.

³ For a detailed description of the technical reviews, please refer to [Annex A](#).

Figure 3. Feedback from practitioners on use of the SHARP tool, 2015–2017

Advantages	Challenges
<ul style="list-style-type: none"> • The holistic and comprehensive nature of the survey made possible a wide picture of rural livelihoods. • The standardization of questions and response options allowed the comparison of results among different contexts. • The use of a tablet facilitated the data collection and entry processes, reducing time and errors. • The survey gave a good understanding of resilience levels and main drivers. • The questionnaire enabled the capture of farmers' concerns through qualitative self-assessment questions. 	<ul style="list-style-type: none"> • The completion of a survey was very lengthy as it contained 54 question modules. • The wording of questions tended to be very technical. • Similar questions were addressed in different modules, increasing the data collection time and the strain on enumerators and farmers replying to similar information several times. • IT problems were often experienced, due to the presence of bugs in the application. • Time needed to customize the SHARP application was very long given the heavy reliance on IT support.

To achieve this, the SHARP team carefully examined the content of the SHARP questionnaire and the derived versions developed since 2015, as well as the scoring system. Attention was also given to the improvement of the question flow and the delivery of a more flexible tablet-based tool to improve users' data-collection experience. Each of these steps is described in detail in **Figure 4**.

The development of **SHARP+** in 2018 was the product of this first technical revision, which consisted of a new questionnaire version and new tablet and web-based applications. The main highlights of the tool were:

- shorter questionnaire (comprising 40 modules instead of the original 54);
- improved scoring system directly linked to the measurement of resilience; and
- reduced time required to customize the questionnaire for field use.

After its release in 2018, SHARP+ was implemented in Burundi and Uganda in the same year to support the development of two projects financed by the GEF.



Figure 4. Steps followed to conduct the first technical revision of SHARP in 2017



Step 1
Examining the standard 54-module SHARP questionnaire

The step focused on the identification of redundant and irrelevant questions and modules. This significantly contributed to reduce the length of the questionnaire, a main concern for users.

Some modules were shifted to improve the flow; whilst the applicability options were refined to ensure the accuracy of the results. As result, an initial set of modules and questions were identified to be kept in the questionnaire.



Step 2
Comparing different SHARP versions

Seven project versions were revised, including the Angola version with focus on land degradation and agropastoral communities; the four versions developed for the adapting irrigation to climate change (AICCA) project; and the versions created for the Gambia and Uzbekistan centered on forest management.

Evaluation project reports (e.g. the Building Resilience and Adaptation to Climate Extremes and Disasters [BRACED] programme in South Sudan) and training feedback were also considered to identify content gaps. This step helped the team to include further feedback from the field and partners (Box 2).



Step 3
Stocktaking of other assessment tools

Other tools were explored to gain a better understanding on how specific socio-economic dimensions, such as women's empowerment, community engagement and sustainability were captured, addressed and measured through household-level questionnaires.

The tools consulted were IFPRI's Women's Empowerment in Agriculture index (WEIA); FAO's sustainability assessment of food and agriculture systems (SAFA); food insecurity experience scale (FIES); the World Census of Agriculture; Land Degradation Assessment in Drylands (LADA); and the Living Standards Measurement Study (LSMS). Acknowledging the value of these tools, relevant questions were reframed, reformulated and incorporated as part of the SHARP+ assessment.



Step 4
Development of SHARP+ questionnaire

The first version of the SHARP+ questionnaire was released in 2018 after following these steps.

2.2.1 Second technical review

In 2019 with the launch of the GEF-7 Dryland Sustainable Landscapes Impact Programme (DSL-IP) (BOX 1), SHARP+ was chosen as the tool to collect baseline data on socioeconomic indicators and to assess smallholders' resilience in six counties in the Miombo and Mopane region.

To respond to the requirements of the new Impact Programme, a second technical review was undertaken and provided a unique opportunity to further refine SHARP+. A comprehensive

review took place in collaboration with FAO's Forestry and Agricultural Development Economics divisions, the former Strategic Programme for reduction of rural poverty and the GEF unit. The tool was also revised by the eight country offices where it was scheduled for implementation.

The main areas requiring improvement were the modules on land and forest degradation phenomena, and socioeconomic aspects linked to poverty analysis and women's empowerment.

BOX 1

Assessing resilience in sub-Saharan Africa under a new GEF-7 Impact Programme

In 2017, FAO was selected as the Lead Agency for the GEF-7 Dryland Sustainable Landscapes Impact Programme (DSL-IP). The programme is expected to provide significant support to countries to avoid further degradation, desertification and deforestation of land and ecosystems through the sustainable management of production landscapes, addressing the complex nexus of local livelihoods, land degradation, climate change and environmental security.

The programme uses a landscape approach to contribute to the land degradation neutrality (LDN) process building upon existing networks and new partnerships, as well as regional, national and global platforms.

DSL-IP is implemented in Angola, Botswana, Malawi, Namibia, the United Republic of Tanzania and Zimbabwe and SHARP+ was selected as one of the M&E tools to track and assess key core interventions and co-benefits of the programme, i.e. climate resilience levels. To ensure the alignment of the tool to the context and programme's needs, the tool underwent an in-depth review by FAO technical units (e.g. Forestry, Gender, Indigenous Peoples), the funding liaison unit (Global Environment Facility [GEF]) and six country offices, as well as key national stakeholders (e.g. Ministry of Agriculture), which resulted in the six tailored versions of SHARP+. In this process, the tool was also translated into Portuguese and Swahili.

A regional training of enumerators took place in South Africa in August 2019 and the baselines surveys were carried out simultaneously in the six countries from September to December 2019. Around 1 200 households were interviewed and six country reports were prepared to present the results regarding resilience levels and livelihoods characteristics.

The information gathered through SHARP+ was instrumental in informing the development of the

Other technical aspects of the application itself were also taken into account, mostly focused on the interconnection of household data with spatial/geographical information gathered through remote sensing.

Based on the above, the original SHARP+ released in 2018 was fine-tuned and adjusted to include, *inter alia*, information on:



- **SDG indicator 2.4.1** conceptual framework on sustainable agriculture (FAO, 2018);
- **access to forest resources and forest management practices**, based on FAO's *National socioeconomic surveys in forestry* (FAO, 2016);
- **status of forests, use of forest products**, including non-timber forest products (NFTP) (FAO, 2016);
- presence of ongoing **community initiatives to improve forest management** (FAO, 2016);
- improved lists of **sustainable land management practices and land tenure**, following FAO's operational guidelines for the design, implementation and harmonization of monitoring and evaluation systems for climate-smart agriculture (CSA) (FAO, 2019);
- **aquaculture and fishing practices**, created in consultation with aquaculture experts in the FAO Country Office in Togo;
- **inclusion of a household roster** to allow identification of household members' involvement in agricultural and non-farm activities and sex/age disaggregation, following the Multidimensional Poverty Assessment Tool (MPAT) of the International Fund for Agricultural Development (IFAD, 2012); and
- optional modules on **food insecurity experience scale (FIES), involuntary resettlement and displacement and housing characteristics**, based on MPAT.

Moreover, a version of the SHARP+ application supported by the platform Collect Mobile was developed to enhance the connection between household-level data collected through SHARP and satellite imagery compiled through Collect Earth.⁴ Ultimately, this would support ground-truthing satellite imagery on land use change and resource-level trends with field-level information.

The 2019 review resulted in eight new country and project-tailored versions of SHARP+, which were operationalized using both FAST – a platform developed by FAO's Information Technology Services Division – and Collect Mobile.⁵

2.2.2 Evaluation of SHARP+: continuing to assess and learn

⁴ The development of the application to the Open Foris tool Collect Mobile was a strategic decision supported by FAO's GEF unit as the integration of georeferenced data with Collect Earth was envisaged during project formulation.

⁵ The SHARP version for Togo was created using the FAST platform as the application was already available in French and the standard questionnaire was better aligned to the project's needs. Two new modules on aquaculture and fishing practices were created in collaboration with the FAO Country Office in Togo.

After two years of field implementation of SHARP+ and two rounds of reviews, the SHARP team launched an online evaluation of SHARP+ in early 2020. The objectives were: on the one hand, to **learn more about the experience of users** and the performance of the tool in the field using the FAST platform; and on the other hand, to **know the extent to which results were translated into effective decision-making and interventions**.

Practitioners, including project managers, project design experts, researchers, enumerators, M&E experts and students, completed the evaluation (refer to [Annex E](#) for the survey questions).

The results showed the following:

- SHARP+ is widely used to inform the design of project interventions and improve targeting.
- SHARP+ has been used in research institutions by master's and doctorate researchers to conduct specialized and comparative studies on climate resilience of rural livelihoods.
- Users see the richness of information collected, the ability to conduct offline data collection and the easy customization process and use as SHARP+'s main strengths when compared to other available tools.
- Users acknowledge that the results coming from SHARP+ are easy to understand, interpret and apply for different purposes.
- The results of the tool and the overall resilience assessment are perceived as precise, reflecting the realities from the field.

However, users involved in data collection, particularly enumerators and field researchers, also noted that:

- there remain some IT-related challenges that need to be addressed to make data collection smoother and improve user experience;
- further developments of the tool using the FAST platform need to be centred on addressing important IT issues (e.g. solving bugs, GPS capturing, data submission) and on providing training for data interpretation; and
- some redundancy in the questionnaire remains, increasing the time needed to complete one survey.

The comprehensive feedback and valuable technical observations conformed the basis of the enhanced **SHARP+ 2020** version.



3

SHARP+ 2020



This section outlines the key elements of SHARP+ 2020. It includes its goals, the working definition of resilience and the methodological guidance for resilience measurement.

SHARP+ 2020 is the outcome of the series of technical reviews and performance evaluation. It results from an iterative and organic process of continued learning from customization, field-level implementation and innovation.

Figure 5. SHARP+ 2020 in a nutshell





3.1 The goal

The goal of SHARP+ is **to assess and increase the resilience of farmers and pastoralists to climate change**, which remains aligned with SHARP’s initial goal (Choptiany *et al.*, 2015).

The assessment has the objective to **support evidence-based decision-making** at the household, project and country levels **to strengthen the resilience and the capacity of smallholders to produce sustainably in the context of climate change.**



Field training of programme staff from organizations under the BRACED consortium (FAO South Sudan, Concern Worldwide, ACTED and The Sudd Institute) in Juba, South Sudan ©FAO/ Colozza, David

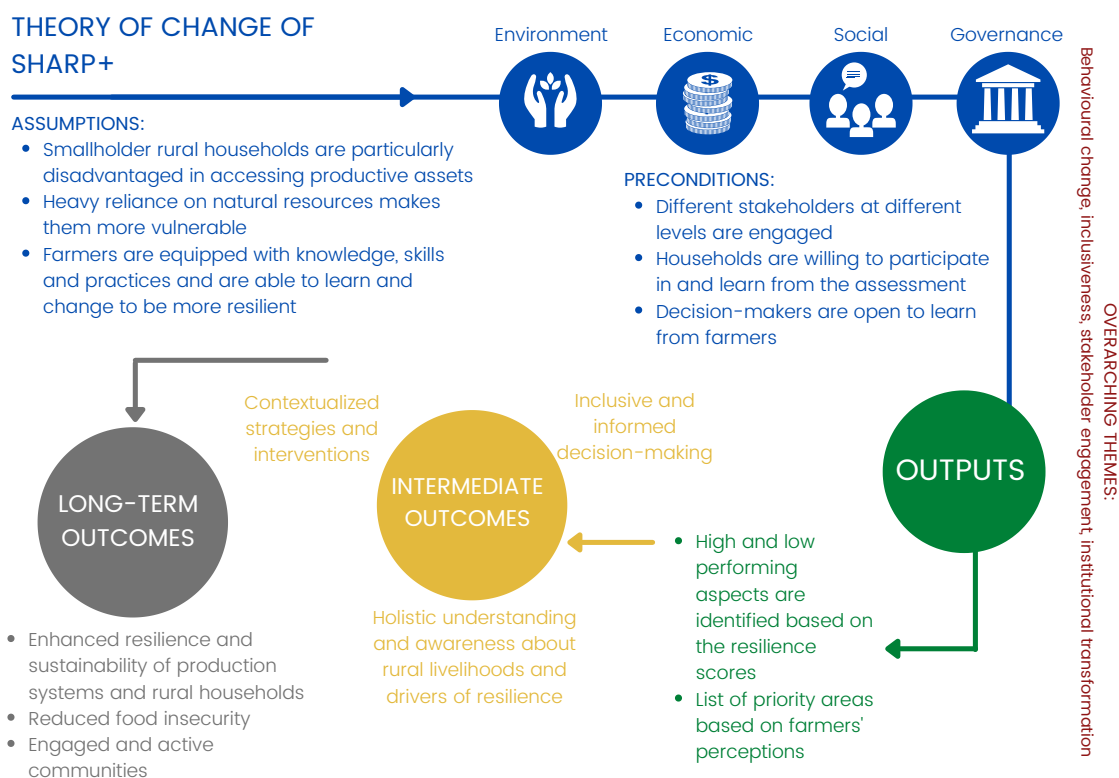
3.2 Theory of change of SHARP+

SHARP+ relies on the assumption that smallholder rural households, particularly in the Global South, present low resilience levels due to inadequate access and management of resources, scant access to knowledge, information and services, inadequate social protection, systemic inequalities and exclusion, making them highly vulnerable to climate and non-climate shocks. Their heavy reliance on natural resources to make a living and difficulty accessing productive assets, including land, financial services, infrastructure and knowledge, reduce their capacity to recover from and adapt to shocks and changing conditions.

These restrictions, combined with increased risks and exposure due to climate change and other socioeconomic phenomena, push households to resort to negative coping mechanisms, such as

the degradation of natural resources, reduced consumption of nutritious meals and dropping out of school, building a negative cycle. Nonetheless, SHARP+ takes into account farmers' (traditional) knowledge, skills and practices as well as community governance mechanisms that are key to build and strengthen their own and their communities' resilience.

Figure 6. Theory of change of SHARP+



Through an integrated (objective–subjective, quantitative–qualitative) approach, the SHARP+ assessment aims at increasing farmers' resilience using a two-pronged strategy: first, identifying the aspects that display low resilience, as well as areas that are considered a priority by farmers for resilience building; second, recognizing households' and communities' strengths that can be leveraged to reinforce and build farmers' resilience.

SHARP+ assumes that going through the assessment itself will enable farmers and practitioners to gain a deeper understanding and awareness of the different components of rural livelihoods and their functioning. Through this increased understanding, farmers and practitioners will be able to reflect, discuss and determine the (set of) actions and resources needed to increase rural households' capacities to cope, respond, transform and adapt to shocks and long-term changes.



Thus, SHARP+ will support farmers and practitioners to find meaningful strategies specific to their context and needs, by providing a detailed, holistic and gender-sensitive picture of rural livelihoods and their functioning.

Assessing and building resilience successfully are nonetheless dependent on the effective and timely engagement of different stakeholders at different levels. Institutional transformation must take place, as resources shall be committed to create an enabling environment that promotes positive change and sustainability in the long term.

3.3 Working definition of resilience

SHARP+ defines resilience as the **ability of a system to recover, reorganize and evolve following external stresses and disturbances** (Choptiany *et al.*, 2015). The definition follows Adger (2000), Carpenter *et al.* (2001), Gunderson and Holling, eds (2002) and Walker *et al.* (2004) and is aligned with the working definition of the Intergovernmental Panel on Climate Change (IPCC, 2012).

The SHARP team also suggests that **resilience can be conceptualized as both an outcome and an inherent characteristic of a social-ecological system**, in which certain system properties, including social, ecological and institutional components, are essential.

Namely, resilience is a system property based on its current features, but also an outcome resulting from the interaction of different factors (e.g. knowledge, skills, financial assets, natural resources access and exposure).⁶

⁶ This approach is mostly used in social sciences for adaptation, where actors take actions and have intentions, which in turn are motivated by circumstances and capacities. This view often conflicts with the ecological thinking where adaptation is generally seen as an emerging property of local parts of the system and autonomous from one to another (Hahn and Nykvist, 2017; Nelson, Adger and Brown, 2007).

BOX 2

Resilience in the context of climate change

When referring to climate, SHARP conceptualizes resilience *vis-à-vis* the climate shocks and extreme events households and communities are exposed to following Lavell *et al.* (2012).

Namely, climate resilience is understood in terms of the following:

- **Exposure:** Analysing and identifying hazards in a given context, while assessing how people and their livelihoods could be adversely affected by climate shocks and are, thereby, subject to potential future harm, loss or damage.
- **Sensitivity:** Understanding the nature of vulnerabilities, i.e. the predisposition to be adversely affected due to the internal characteristics of what is being affected. For instance, how the identified shocks impact various aspects of rural livelihoods due to their current settings (e.g. type of and access to assets, production, exchange).
- **Adaptive capacity:** Assessing the capacity of households to deal with and respond to these shocks and variability.

To address these features in the specific context of climate change, a dedicated version of SHARP+ is available for practitioners. See [subsection 4.2](#) for more details.

Lavell, A., Oppenheimer, M., Diop, C., Hess, J., Lempert, R., Li, J., Muir-Wood, R. & Myeong, S. 2012. Climate change: New dimensions in disaster risk, exposure, vulnerability, and resilience. In C.B. Field, V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea *et al.*, eds. *Managing the risks of extreme events and disasters to advance climate change adaptation. A*

3.4 Principles of SHARP+ to assess resilience

In line with the definition of resilience, SHARP+ considers the use of **an integrated, holistic and multi-actor approach as a core principle** to assess resilience. As resilience is considered a property of the farm system itself, **building and strengthening it goes beyond responding to short-term stressors.**

It also promotes inclusive, gender-sensitive and multistakeholder decision-making processes by actively engaging local and national stakeholders throughout all the steps of the assessment.



BOX 3

Principles of SHARP+ to assess resilience

- Consider a **holistic approach** to understanding farm system resilience, highlighting the importance of social and economic aspects, as it emerged from the literature review how much they can affect the resilience of households and communities.
- Use an **integrated methodology** centred on the farm/household/farmer approach to understand past and present contexts.
- Recognize **general resilience as a system property** and climate resilience as a specific property.
- Define an **assessment that goes beyond hazards and short-term climate shocks**.
- Promote a **flexible knowledge exchange and learning approach** that can be used for project planning, implementation and monitoring and evaluation (M&E).
- Highlight that **resilience does not equal development**.
- Promote the **active engagement of local and national stakeholders** before and during the assessment process to increase ownership.
- Promote an **inclusive assessment and multistakeholder decision-making approach** from the design of the survey to the discussion of results, definition of the activities for resilience building and M&E.
- Integrate a **gender approach** in the design, collection, analysis and interpretation of data.
- Overlay **different sources of information** (e.g. earth observation/satellite imagery, group discussions) to enhance the knowledge of the realities in the field that allow for informed decision-making.

3.5 An indicator approach to assess resilience

SHARP+ uses a set of indicators or principles to understand how resilient a farm system is, and what strategies are being used to build it at the household level. In 2014, the team identified the agro-ecosystem indicators described by Cabell and Oelofse (2012) as a suitable methodological framework to assess the resilience and this still constitutes the theoretical grounds of SHARP+.

Using indicators was deemed adequate given the complexity of measuring resilience directly (Bennett, Cumming and Peterson, 2005; Cumming *et al.*, 2005; Carpenter *et al.*, 2001; Fletcher, Craig and Hilbert, 2006; Darnhofer *et al.*, 2010). Moreover, the use of overarching principles proved particularly useful as these are flexible for adaptation and contextualization, while

providing a mechanism to assess and compare resilience consistently and in a systematic manner.

This vision is also noted by the Overseas Development Institute (ODI) in their *Comparative overview of resilience measurement frameworks*, which states:

Due to the need to be context-specific, [...] universal principles of resilience are necessary to ensure that there is accountability and above all that it is truly resilience being measured (Schipper and Langston, 2015, p. 9).

Although some conceptual frameworks defining indicators or principles to assess resilience existed at the time of the initial development of SHARP, only a few were sufficiently practical to allow their operationalization in the field, for instance via structured surveys.

Cabell and Oelofse's indicators use a system approach, in which the authors map all the different components of a social-ecological system, such as farm systems, and see how these interact among each other. Then, the different components are combined to understand how these influence resilience (e.g. whether there is a positive or negative relationship) and to provide a representation of the overall farm system resilience (Choptiany *et al.*, 2015).

The team selected and adapted these 13 indicators given their relevance to farm systems in rural settings, as they capture the complexity of interactions and elements embedded in these. For instance, they explore ongoing social and ecosystem interlinks, the economic dimension of agricultural production and off-farm activities, and how natural resources are accessed and managed. Thus, the indicators allowed recognition of the elements that are essential to understand, analyse and measure resilience using holistic and integrated approaches. The selected agro-ecosystem indicators also comprise the notions of change or transformation of a system over time, which is a fundamental element embedded in the working definition of resilience in SHARP+.

Lastly, Cabell and Oelofse's theoretical framework was suitable for translation and easily operationalized through a questionnaire. The indicators were used to ensure that the survey collected all the data needed for a holistic understanding of farm system resilience. For instance, the indicator "Reasonably profitable" supported the inclusion of on-farm and off-farm income-generating activities, investment decisions and presence of savings, among others.

The indicators are presented in **Table 1**, including their definitions, implications for resilience and the elements sought through the questionnaire.



Table 1. Indicators for assessing the resilience of agro-ecosystems

Indicator	Definition	Implications	What to look for
1. Socially self-organized	The social components of the agro-ecosystem are able to form their own configuration based on their needs and desires.	Systems that exhibit a greater level of self-organization need fewer feedbacks introduced by managers and have greater intrinsic adaptive capacity.	Farmers and consumers are able to organize into grassroots networks and institutions (e.g. cooperatives, farmers' markets, advisory networks).
2. Ecologically self-regulated	Ecological components self-regulate via stabilizing feedback mechanisms that send information back to the controlling elements.	A greater degree of ecological self-regulation can reduce the need for external inputs (e.g. nutrients, water and energy) to maintain a system.	Farms maintain plant cover and incorporate perennials, provide habitat for predators and parasitoids, use ecosystem engineers, and align production with local ecological parameters.
3. Appropriately connected	Connectedness describes the quantity and quality of relationships between system elements.	High and weak connectedness provides diversity and flexibility to the system; low and strong connectedness imparts dependency and rigidity.	Farmers collaborate with multiple suppliers, outlets and fellow farmers; the presence of polycultures encourages symbiosis and mutualism while providing movement corridors, etc.
4. Functional and response diversity	Functional diversity is the variety of ecosystem services that components provide to the system; response diversity is the range of responses of the different components to environmental change.	Diversity protects against shocks and provides seeds of renewal following disturbance.	Heterogeneity of features within the landscape and on the farm; diversity of inputs, outputs, income sources, markets, pest controls, etc.
5. Optimally redundant	Critical components and relationships within the system are duplicated in case of failure.	Redundancy may decrease a system's efficiency, but it gives the system multiple response options.	Multiple crop varieties and animal breeds; multiple sources of nutrients, several water sources, etc.
6. Spatial and temporal heterogeneity	There is patchiness across the landscape, which changes over time.	Like diversity, spatial heterogeneity provides seeds of renewal following disturbance; over time, it allows patches to recover and restore nutrients.	Patchiness on the farm and across the landscape, mosaic pattern of managed and unmanaged land, diverse cultivation

Indicator	Definition	Implications	What to look for
			practices, crop rotations, etc.
7. Exposed to disturbances	The system is exposed to discrete, low-level events that cause disruptions without pushing the system beyond a critical threshold.	Such frequent, small-scale disturbances can increase system adaptive capacity in the long term by promoting natural selection and novel configurations during the phase of renewal; known as "creative destruction".	Testing new land/water management techniques; changing practices; incorporation of improved seeds/breeds; pest management that allows a certain controlled amount of invasion, etc.
8. Coupled with local natural capital	The system functions as much as possible within the means of the local natural resource base and ecosystem services.	Responsible use of local resources encourages a system to live within its means; this creates an agro-ecosystem that recycles waste, relies on healthy soils and conserves water.	Builds (does not deplete) soil organic matter; presence of trees; recharges water; limited need to import nutrients or export waste, etc.
9. Reflective and shared learning	Individuals and institutions learn from past experiences and from present experimentation to anticipate change and create desirable futures.	The more people and institutions can learn from the past and from each other, and share that knowledge, the more capable the system is of adaptation and transformation.	Extension and advisory services for farmers; cooperation and knowledge sharing among farmers; knowledge about the state of the agro-ecosystem; behavioural change.
10. Globally autonomous and locally interdependent	The system has relative autonomy from exogenous (global) control and influences and exhibits a high level of cooperation between individuals and institutions at the more local level.	A system cannot be entirely autonomous, but it can strive to be less vulnerable to forces that are outside its control. Local interdependence can facilitate this by encouraging collaboration and cooperation rather than competition.	Less dependence on commodity markets and on external inputs; more sales to local markets; reliance on local resources; existence of farmer cooperatives and community-based organizations; close relationships between producers and consumers.
11. Honours legacy	The current configuration and future trajectories of systems are influenced and informed by past	Also known as path dependency, this relates to the biological and cultural memory embodied in a	Maintenance of heirloom seeds and breeds; engagement of elders in education and production;



Indicator	Definition	Implications	What to look for
	conditions and experiences.	system and its components.	combination of traditional cultivation techniques with modern knowledge; traditional forecasters use.
12. Builds human capital	The system takes advantage of and builds resources through increased knowledge and education, social relationships and membership in social networks.	Human capital includes cultural (individual skills and abilities), social (social organizations, norms, formal and informal networks) and constructed (economic activity, technology, infrastructure) aspects.	Access to education and training; nutrition; gender equality; festivities; public programmes that give training opportunities; investment in farm infrastructure; group membership; expenditure on education.
13. Reasonably profitable	The segments of society involved in agriculture are able to make a livelihood from the work they do without relying too heavily on subsidies or secondary employment.	Being reasonably profitable allows participants in the system to invest in the future; this adds buffering capacity, flexibility, and builds wealth that can be tapped into following release.	Farmers manage to sell the desired agricultural produce; produces are paid on time; access to private land; size of herds; farmers manage to invest in their farms (inputs and infrastructure).

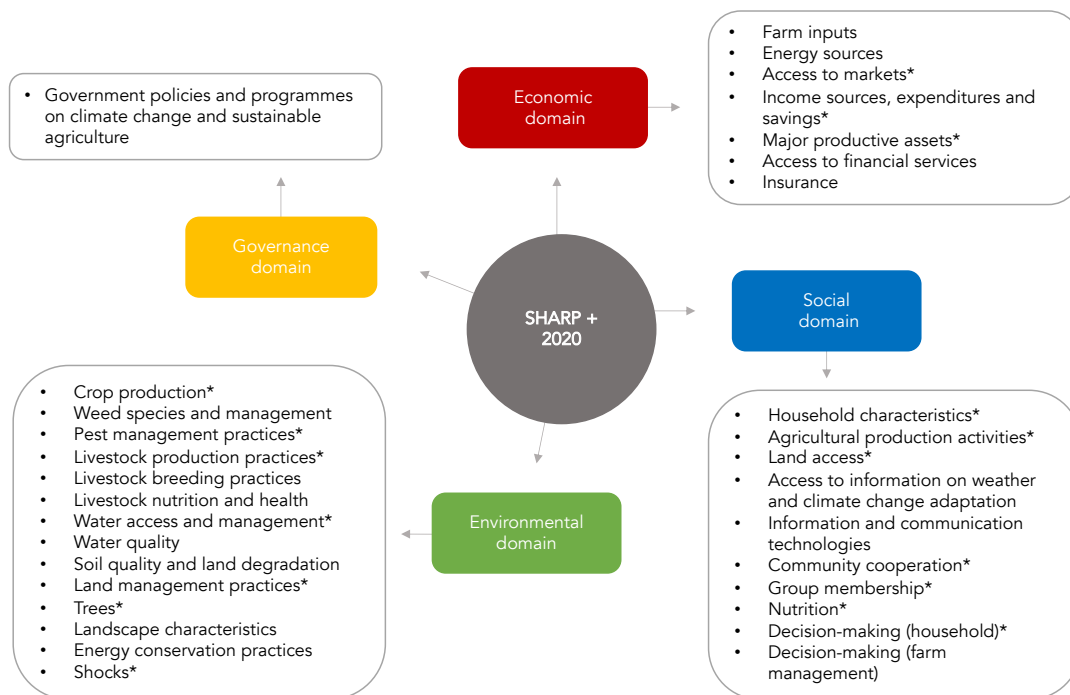
Source: Choptiany et al. 2015 (based on Cabell and Oelofse, 2012) (adapted).

3.6 Structure of the SHARP+ questionnaire and scoring system

The definition of resilience and the agro-ecosystem indicators guided the development of the first SHARP questionnaire in 2014. Further extensive literature review, consultation with experts and field-testing supported the elaboration and refinement of questions and response options that embed the questionnaire and all the derived versions. The four elements – resilience definition, indicators, expert knowledge and field experience – constitute the theoretical and empirical foundations of SHARP+.

All SHARP+ questions are assigned to one of the four broad domains (**environmental, economic, social and governance**) and organized into different thematic modules describing a particular element of the farm system.⁷

Figure 7. SHARP+ thematic modules and domains



Note: Asterisks denote mandatory core modules; other modules are considered optional.

Except for the self-assessment of adequacy, all the survey questions contribute to at least one of the 13 agro-ecosystem indicators.

Table 2. Example of link between the agro-ecosystem indicators and SHARP+ questions provides an example of how the SHARP+ modules and questions are connected to the 13 agro-ecosystem indicators. The full table is available in [Annex C](#).

Table 2. Example of link between the agro-ecosystem indicators and SHARP+ questions

⁷ SHARP's first questionnaire was field-tested in Uganda and Burkina Faso in early 2015, which allowed for a better reformulation of questions, added improved response options and shortened the length of the questionnaire. The field-testing helped to assess the questions' suitability and relevance, as well as to detect the gaps where more or different questions were needed to assess resilience. For more details, see Choptiany et al., 2015.



Indicator	SHARP+ module and domain	SHARP+ questions	What is looked at	Answers/ units	Score
1. Socially self-organized Farmers and consumers are able to organize into grassroots networks and institutions such as cooperatives, farmers' markets, community sustainability associations, community gardens and advisory networks.	4. Land access (Domain: Social)	In the last 12 months, what type of land did you use for your agricultural activities?	Whether farmers have secure access to land for their farming activities.	Whether the following options are selected: Communal agricultural land; Communal forest land; Pastures land	If any of the options selected from the list=10
	23. Access to markets (Domain: Economic)	In the last 12 months, were you able to sell the products from your farm system you wanted to sell?	Whether farmers are organized for selling.	Options: Yes, most of them, Yes, but only few, No	Yes, most of them =10 Yes, but only few =5 No =0
		Did you sell your products...	Whether farmers are organized for selling.	Options: Alone, informal producer group, formally registered producer group	Alone=0 Through an organised producer group (informal)=7 Through an organised producer group (formally registered)=10
		Where did you sell your products?	Whether farmers are organized for selling.	Number of options selected among the following:	None of the listed options=0 One of the options=7 Two or more=10
		How do you set prices for the products you usually sell?	Whether farmers are organized for selling.	Options	Through the cooperative /farmers' organization=10 Price chosen based on available information= 8 I take the market's prices= 5 The dealer establishes them=0 Other (specify)=N/A
	28. Community cooperation (Domain: Social)	Did you join other community members to address the problem?	People address and solve problems jointly.	Yes/No	Yes= 10, no= 0

3.6.1 Modules

The modules contained in the questionnaire portray a specific element of the farm system.

SHARP+ 2020 contains 33 modules,⁸ of which 17 are deemed mandatory for the assessment and 16 are considered optional (**Figure 7**). The optional modules are provided to allow users to customize their own questionnaire versions and adapt them to specific contexts and project objectives.

Each module embeds two scoring components: one to capturing objective and scientific information ("technical resilience"), and a second focusing on a self-assessment element ("self-assessed adequacy"). Each of these are explained in detail below.

a) Technical resilience component

This structured component examines factual information on the agricultural production unit (farm) or agriculture-based household. As this information is objective, it can be easily measured, counted or assessed by the respondent.

This component is placed at the beginning of each module and it is usually conformed by a set of yes/no questions and single and/or multiple choice options. For instance, it explores the number and varieties of crops planted, the types of land management techniques used or whether the farmer has access to markets or not.

Each response option given by the farmer is scored based on a scoring matrix developed by the team as outlined in [subsection 3.6.2](#). A score from 0 to 10 is assigned to this component, maintaining a positive relationship with resilience, where 10 means high resilience and 0 minimal resilience.

b) Self-assessed adequacy component

This component explores farmers' level of satisfaction with a given aspect. Unlike the technical component, it is subjective and farmers have the opportunity to express their views as regards the aspect under question.

For instance, in the module covering livestock health management, farmers are asked to rank the extent to which the disease management practices and veterinary services they used allowed them to effectively preserve the health of their livestock.

⁸ The first SHARP questionnaire contained 54 modules, of which 26 were mandatory ([Choptiany et al., 2015](#))



To assess the level of the adequacy, the response options use a five-segment Likert-scale spanning from “Not at all” to “Completely”. The responses are then translated into quantitative information, ranging from 0 (Not at all) to 10 points (Completely). A score of 10 signals complete adequacy, satisfaction or sufficiency levels of a given aspect, while 0 suggests inadequacy.

The scoring scale used in this component is standard in any given module. This component is always placed at the end of each module.

The technical and self-assessed components are mandatory to calculate the resilience scores. As such, the questions used for these calculations are marked with asterisks.

An example of a question module with both components is shown in **Figure 8**.

Figure 8. Example of a question module of SHARP+

*15. Land management practices (core module)					
*15.1 In the last 12 months, did you take any actions to improve or preserve the quality of your soil?	Yes		No		
*15.2 Which ones?					
Liming (applying chalk, limestone, wood ashes and similar material to decrease soil acidity and improve soil activity)	Fallowing/shifting cultivation		Slash and burn		
Zero/minimum tillage	Rotational grazing		Crop rotation		
Wind break/hedge	Intercropping		Mulching		
Manuring/composting	Vegetative strips		Agroforestry (trees grow in the fields), afforestation, forest protection		
Gully control/rehabilitation	Terracing or boundary planting (including contour planting)		Creating a fire break		
Planting cover crops	Living fences		Planting nitrogen-fixing annual or perennial plants (e.g. legumes)		
Building earth or soil bunds	Crop residues		Animal urea		
Synthetic fertilizers		Other management practices (specify)			
*Did you produce the natural fertilizers/amendments in your farm? 15.2= manuring/composting or urea or synthetic fertilizers	Yes		No		
*How do you determine how much fertilizer (synthetic or natural) to apply to your crop(s)? 15.2= manuring/composting or urea or synthetic fertilizers Single select	We apply fertilizer based on a careful assessment of our soil and crops, not exceeding the recommended doses (including farmer observation, professional tests or analyses, guidelines given by extension services or retail outlets)		We apply fertilizer based on general advice for the region or for our crop(s)		Based on how much we can afford without any assessment
Over the last year, did you use any of the following measures to mitigate the environmental risks associated with the use of fertilizers: 15.2= manuring/composting or urea or synthetic fertilizers Multiselect 'Did not use any' cannot be selected with any other options	Avoid application before and after (forecasted) rainfall event		Split fertilizer application according to crop uptake		Avoid application on steep slopes or in areas prone to flooding
	Use enhanced efficiency fertilizers (urease inhibitor)		Use buffer strips along water courses		Did not use any
*To what extent did the land management practices used help to preserve the quality of your farmland? 15.1=yes	Not at all	A little	Average	A lot	Completely

Technical component

Self-assessed adequacy component

Self-assessed importance component

Unlike SHARP and earlier versions of SHARP+, where this element was present in each module and assessed similarly to the self-assessed adequacy component, the 2020 version includes the self-assessed importance component as a single separate module. This constitutes a major change in the SHARP+ 2020 questionnaire and is presented in **Figure 9**.

Figure 9. Self-assessment of importance module in SHARP+ 2020

*Farmers' priorities (self-assessed importance)		
*Based on all the topics we have discussed today, what would be the most important changes needed to improve your household's ability to	How do you think these changes can be achieved? List: Through increased knowledge (e.g. training,	QUESTION FOR THE ENUMERATOR: Assign each area mentioned by the farmer to one of the



<p>cope with unexpected stresses and strengthen your livelihoods?</p> <p>Please list the changes you consider to be the most important ones.</p>	<p>courses); Through better access to information (e.g. prices, weather, outbreaks); Through better access to services (e.g. financial, health); Through better infrastructure (e.g. roads); Other (specify)</p>	<p>aspects assessed in the SHARP survey (it can be completed later)</p> <p>List: Expanded survey modules and topics + Other (specify)</p>
1.		
2.		
3.		

The aim is to give respondents the opportunity to reflect on the different aspects covered and discussed through the assessment and prioritize those they consider as the most important ones for resilience building.

This approach is largely incorporated in qualitative research through household surveys (OECD, 2013; Jones and Tanner, 2015; Grothmann and Patt, 2005) and It was deemed adequate for the SHARP+ survey. The work led by Jones (2019) is a good example of how self-assessments can be systematically measured and monitored through household surveys. This is particularly important when surveys aim to be **participatory** and inclusive of people’s perceptions and needs, especially with regard to resilience assessment.

The prioritization process is done *vis-à-vis* what farmers consider to be the most important changes necessary to improve their household's ability to cope with unexpected stresses and strengthen their livelihoods.



Field-testing of the SHARP+ app during a training workshop in Namibe, Angola © FAO/M. Hernández Lagana

Following prioritization by farmers, enumerators, data collectors or analysts match these priority areas to the topics covered through the assessment. This step allows the “aggregation” of responses that can later be used to define community-based priorities and formulate potential interventions to meet farmers’ specific needs.

3.6.2 Scoring system

Every close-ended question (e.g. yes/no, single/multiple choice) within the technical score contributes to at least one of the 13 agro-ecosystem indicators. As such, it has an assigned score that attempts to capture its relationship – either positive or negative – with and contribution to resilience.

The initial scores were developed based on e-discussions with over 150 academics and experts taking place in 2014 (Choptiany *et al.*, 2015). After the technical reviews (outlined in [subsection 2.2](#)), further literature review and ongoing international dialogues and processes regarding resilience, sustainability and climate action (e.g. Alkire *et al.*, 2013; Douxchamps *et al.*, 2017; FAO, 2014; 2030 Agenda) were used to support the definition and refinement of the scores.



The scoring system and questionnaire used in SHARP+ were reviewed by technical experts and units within FAO, including the Pest and Pesticide Management Team, Ecosystem Approach to Crop Production Intensification Team, the Land and Water Division and the Animal Production and Health Division, as well as by funding liaison units hosted in FAO, such as the GEF unit nested in the Office of Climate Change, Biodiversity and Environment.

Table 2 provides an example of how the questions are scored; the full scoring table is available in [Annex C](#).

Both the full SHARP+ 2020 questionnaire and scoring table are included in this document for reference and use. Refer to [Annexes B](#) and [C](#) respectively.

3.7 Defining resilience levels and farmers' priorities

The scores obtained from the technical and self-assessed adequacy component are combined into a general score of resilience, called the **Compound Resilience Score**. The compound score ranges from 0 to 20 as it is the sum of the technical score (maximum 10 points) and the self-assessed adequacy score (maximum 10 points). Farms with lower resilience levels will obtain scores closer to 0.

Scores can be normalized to other numbers (e.g. 10) if it is desired that all data look and read the same way across all records.

Generally speaking, low scores can be caused by either the absence or the low performance of the resource/status in question (i.e. technical resilience score), and/or because people consider the aspect in question to be insufficient for the good functioning of their farm systems and households (self-assessed adequacy score). **Table 3** presents an explanation on how the compound resilience scores can be interpreted based on the resilience threshold they are in.

Table 3. Resilience thresholds used to determine resilience performance

Resilience threshold	Compound resilience score (Scale: 0–20 points)	Meaning
Low resilience levels	0–7 points	Households have restricted capacity (knowledge, skills, resources) to address the issues in the farm systems. Actions taken to

		cope, adapt and transform have been piecemeal, insufficient and/or inadequate to meet short- and long-term requirements.
Medium resilience levels	7.01–12 points	Households are aware of issues and are equipped with some capacity to cope, adapt and transform when changes occur. However, not all aspects of the problem are addressed because of restricted or inadequate information, know-how, resources, etc.
High resilience levels	12.01–20 points	All or most of the issues are timely recognized and addressed. Households are able to learn from past events and adopt individual or collective strategies to improve their livelihoods. Their set of knowledge, skills and resources appear to be adequate to meet their short- and long-term needs.

The third component – **self-assessed importance** – flags the areas respondents consider as paramount to improve their household's resilience, increase its ability to cope with unexpected stresses and strengthen their livelihoods. The results from this component are analysed separately, using qualitative analysis for data aggregation by identifying the most frequent priority areas.

The aggregated results are then compared with the results obtained through the compound resilience score. This enables the identification of patterns, similarities and divergence between communities' own priorities and areas in need of intervention from an objective viewpoint. For instance, although land might seem heavily degraded due to the use of unsustainable practices, respondents might consider it more important to address their poor access to markets.

These data can be also disaggregated by sex in order to better understand the needs of men and women for resilience building.

Figure 10. Flow chart on how resilience levels and priority areas are defined in SHARP+



Table 4 provides instances of how the compound resilience score was calculated from the responses given to specific modules. This exercise aims to provide an overview of respondents' priorities using integrated (objective + subjective) and inclusive approaches.

Table 4. Examples of calculation of the compound resilience score

Module	Question	Aspect measured	Technical (/10) (A)	Adequacy (/10) (B)	Compound resilience score (/20) (A+B)	Importance
Land and soil quality	List the main soil degradation processes you have observed in the last 3 years.	Types of soil degradation processes observed	No degradation = 10 One process = 7 Two processes = 4 Three or more processes = 0	Not at all = 0 A little = 2.5 Average = 5 A lot = 7.5 Completely = 10	R = 4 + 5 R = 9 Moderate resilience	Ranked as second top priority
Income sources	Is the household member engaged in any non-farm income-generating activity?	Presence of non-farm income	Yes, all year = 10 Yes, seasonally = 7 Yes, occasionally = 5 No = 0	Not at all = 0 A little = 2.5 Average = 5 A lot = 7.5 Completely = 10	R = 5 + 2.5 R = 7.5 Moderate resilience	Ranked as first top priority

The first example considers the case of the module on “**Land and soil quality**”.

- a) The first row provides information on the main soil degradation processes observed on the farmland. In this example, the farmer identified wind erosion and aridification as the processes observed in the last three years. Based on the scoring table, the selection of two options translates to the technical score of 4 points in a scale of maximum 10 points, as it might suggest the presence of heavily degraded land.⁹
- b) Afterwards, the farmer mentioned that the soil on his/her land was only suitable for carrying out agricultural activities, which is reflected in an adequacy score of 5 (out of 10).

⁹ Note that the module on land degradation also considers other elements such as soil texture and colour, water retention capacity, presence of microbiota, and trends in land degradation to determine the final resilience score of this module. See [Annex C](#) for the full scoring table.



- c) The combination of both scores resulted in a compound resilience score of 9 out of 20 possible points. According to **Table 3**, this result suggests moderate levels of resilience in this given aspect.
- d) Finally, by checking the results of the Importance modules, the farmer considered “to have better soil quality to improve your agricultural activities and household food security” as one of the three key areas of action for improving her/his resilience.
- e) By analysing both – the compound resilience score and the importance levels given to soil quality – addressing land and soil degradation (e.g. through sustainable land management practices) would be a priority for farmers themselves and for projects in order to enhance resilience levels.

The second example refers to the presence of non-agricultural income, captured in the module on “**Income sources, expenditures and savings**”.

- a) In the example, the farmer mentions that family members are engaged in these types of activities only occasionally, which attributes a score of 5.
- b) Subsequently, *vis-à-vis* the intermittent presence of non-farm activities to generate household revenues, the farmer stated that these are “little” adequate in terms of their contribution to household revenues and food security.
- c) Jointly, the technical and adequacy scores provide a compound score of 7.5 points suggesting moderate resilience levels.
- d) Based on the results, this aspect could also be considered at risk of falling to low resilience levels if a shock occurs, as it is very close to the low resilience threshold.
- e) Given this vulnerability – also observed by the respondent – the farmer states that further engagement in non-farm income-generating activities would certainly improve the household access to food and overall well-being, thus ranking it as top priority.
- f) In the example, the project could target activities that foster the diversification of income sources, including those outside agriculture and/or along the value chain.

3.8 SHARP+ tablet application

The SHARP+ questionnaire is implemented in the field via a tablet-based application. The application is supported both on the Open KoBoCollect Mobile and on the KoboCollect platforms.

Table 5. Key characteristics of the SHARP+ application

Key features	
Platform used	KoBoCollect application available on the Google Play Store®
Operating system	Android
Offline use	Yes
Online use	No
GPS coordinates	Yes
Data export format	CSV, Excel
On-site assessment results	No
Customizability	Yes
Time required to customize the tool	1–5 days depending on the number and extent of changes
Cost	Standard long and short versions are free of charge

The application can be downloaded from the website www.fao.org/in-action/sharp.

To be able to use the SHARP+ on your mobile device, the Collect Mobile application needs to be downloaded from the Google Play Store ®.

4

Uses of SHARP+



This section offers guidance on how to use SHARP+ as an M&E tool. It provides insights on the nature of the information SHARP+ collects and proposes examples on how the tool can be integrated in the M&E systems of projects. It also presents how the tool contributes to building evidence for informed policy- and decision-making, including international processes, such as the Paris Agreement and the SDGs.

4.1 SHARP+ as a tool for project formulation and M&E

SHARP+ collects a wide variety of information that supports practitioners to gather primary data from potential and current project participants and communities. The survey covers comprehensive information on socioeconomic characteristics, as well as agronomic practices in place, environmental factors and formal and informal community governance mechanisms. This provides the means for a detailed analysis of resilience and rural livelihood profiling for planning and decision-making.

As such, SHARP+ has been instrumental to support the **formulation of development projects with a focus on climate resilience, adaptation and sustainable resource management**. SHARP+ has been widely used in needs assessments and gap analyses supporting evidence-based decision-making, informing the design of project and programme interventions, as well as improving targeting for resilience building. For instance, SHARP+ was used as part of an integrated tool assessment to inform the development of six country projects in the Miombo-Mopane landscapes in the framework of the DSL-IP (see [BOX 1](#)).

SHARP+ offers detailed information to track and measure a diverse range of output, outcome and impact indicators that can be systematically monitored through data collection along the project cycle. This feature has led to the use of SHARP+ as an **M&E tool** in different national and regional projects and programmes. Routine data collection exercises using SHARP+, such as baseline and endline surveys, have helped track output indicators and project activities and interventions. Likewise, the collected data and resilience indicators resulting from the assessments at different points in time have also been used as an indicator of longer-term changes in resilience and food security status at different scales.

Table 6 presents a selection of indicators that can be derived from the survey and can serve as guidance for practitioners during definition of the indicators.

Table 6. Example of progress, outcome and impact indicators based on SHARP+ questions

Type of indicators	How?	Example
Progress and output indicators	The tool allows to monitor the advancement of project activities through the definition of output indicators based on the questions contained in the tool.	<ul style="list-style-type: none"> • Number of households using sustainable practices to manage land • Number of households using agricultural water management practices • Number of households with access to community-based groups • Number of income sources of households, including non-farm ones
Outcome indicators	Short- and mid-term effects of project interventions on beneficiaries and community stakeholders can be measured and tracked over time.	<ul style="list-style-type: none"> • Decreased percentage of households using synthetic pesticides • Increased access to community cereal banks • Increased percentage of households with better nutrition, reflected in a higher dietary diversity score
Impact indicators	Long-term changes resulting from project interventions can be measured through the data collected, especially when projects focus on increasing smallholders' resilience to climate and other shocks.	<ul style="list-style-type: none"> • Increased climate resilience of farmers • Increased food security of rural households • Improved capacity of farmers to timely respond and adapt to climate shocks • Increased ownership of productive assets, particularly among rural women



An example of this is the IFAD and GEF-financed Resilient Food Systems (RFS) Impact Programme,¹⁰ which is currently using SHARP+ in seven countries in sub-Saharan Africa as part of its M&E framework, aiming to monitor and assess global environmental benefits and agro-ecosystem resilience. The information collected through the tool is therefore directly useful for programmatic decision-making.

Wherever possible it is advisable to further disaggregate the indicator, according to the following criteria:

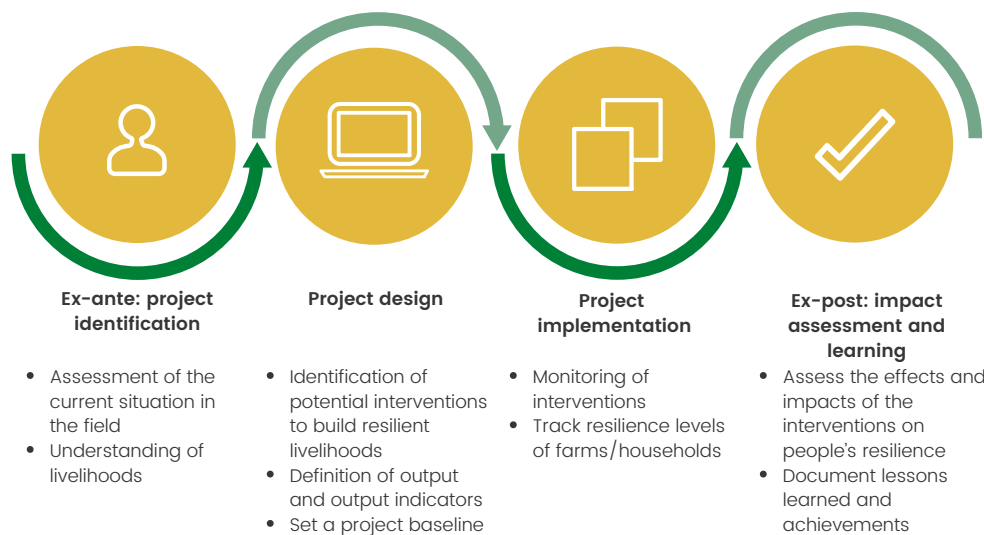
- **Gender**, a more refined disaggregation of the indicators can be done to better capture the gender dimension within projects, programmes and policies
- **Geographic / landscape area**, computing the indicators by administrative units within a country, watershed or river basin, as needed and as appropriate

These levels of disaggregation and/or a combination of those, particularly for impact indicators, will give further insight on the dynamics of resilience and food security status, providing key information for remedial policies and actions.

Based on the different uses for M&E highlighted in **Table 6**,

Figure 11 summarizes how and at which stage of the project cycle the tool can be used.

Figure 11. SHARP+ use in the project cycle



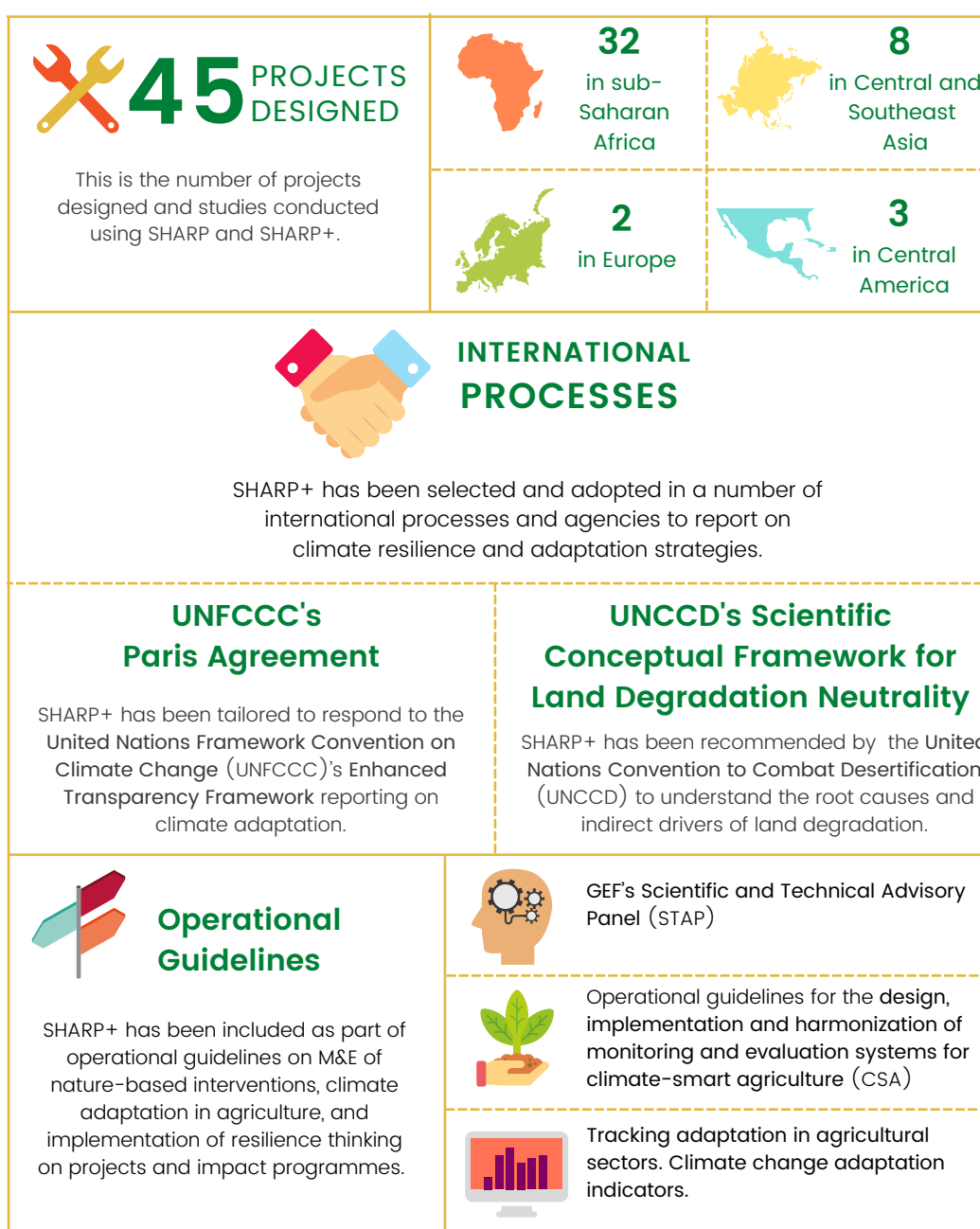
¹⁰ For more details about the RFS Impact Programme, see <http://resilientfoodsystems.co/>

For a step-by-step guide on how the tool can be used and how it needs to be adapted depending on the scope of its use, see [Section 5](#).

4.2 Using SHARP+ to support evidence-based policy- and decision-making

The large adoption of SHARP+ has prevailed due to the endorsement and use of different agencies and as part of international processes.

Figure 12. Uses of SHARP+ for evidence-based decision-making





In close collaboration with FAO's Office of Climate, Environment and Biodiversity, the SHARP team adapted the tool to respond to the needs of countries and country-wide adaptation programmes to meet the **United Nations Framework Convention on Climate Change (UNFCCC)'s Enhanced Transparency Framework (ETF)**. The main characteristic of this process has been the tailoring of SHARP+ to explicitly include a climate dimension as well as the adaptation capacity component in the questionnaire¹¹ and compound score.

BOX 4

Adaptation of SHARP+ to UNFCCC's Enhanced Transparency Framework

SHARP+ has been identified as a tool that countries can use to gather information on key areas of the United Nations Framework Convention on Climate Change (UNFCCC)'s Enhanced Transparency Framework (ETF)'s Modalities, Procedures and Guidelines:

- ETF area B: Impacts, risks and vulnerabilities
- ETF area C: Adaptation priorities and barriers
- ETF area F: Monitoring and evaluation of adaptation actions and processes

To ensure a good alignment of SHARP+ with the reporting requirements, the SHARP team and the FAO Office of Climate, Environment and Biodiversity have carefully reviewed and tailored the tool to enhance the nuance of resilience assessment in the context of climate risks and uncertainties. The customization was based on the conceptualization of resilience *vis-à-vis* the climate shocks and disturbances communities are exposed to, namely understanding resilience in terms of exposure, sensitivity and adaptive capacity.

The adapted version will be used to understand the current levels of resilience of rural households, while identifying strategies to increase their adaptive capacity and reduce their vulnerability, improving their climate resilience as a whole. The information collected through the SHARP+ ETF version will support countries to enhance the planning of context-specific adaptation investments and access climate finance by showcasing how integrated strategies improve climate resilience.

GEF's Scientific and Technical Advisory Panel (STAP) has identified SHARP+ as a tool for applying resilience thinking in projects and impact programmes (Tengberg and Valencia, 2017). According to STAP, implementation of resilience thinking entails assessment of resilience, an adaptation pathway and transformation of socioecological systems, all of which are effectively incorporated in SHARP+.

¹¹ See <https://unfccc.int/enhanced-transparency-framework> for more details on the Paris Agreement's Enhanced Transparency Framework and <http://www.fao.org/publications/card/en/c/CB3505EN/> for more information on how SHARP+ was made ETF-ready.

SHARP+ takes part in FAO's operational guidelines for the design, implementation and harmonization of monitoring and evaluation systems for climate-smart agriculture (CSA) to track Pillar 2 on adaptation and resilience (FAO, 2019). SHARP+ is also included as part of the selected frameworks and tools included in the FAO publication, *Tracking adaptation in agricultural sectors. Climate change adaptation indicators* (FAO, 2017).

Likewise, the tool has been recommended by the United Nations Convention to Combat Desertification (UNCCD)'s **Scientific Conceptual Framework for Land Degradation Neutrality** (Orr *et al.*, 2017), as it allows the study of different social-ecological systems to understand the root causes of land degradation (e.g. land use change, management practices), the indirect drivers of land degradation (e.g. land tenure issues) and the different types of populations relying on land and forest resources (e.g. Indigenous groups, land/forest/livestock-dependent households, women/men/dual decision-makers). Moreover, the integrated assessment emphasizes the involvement of potential beneficiaries to assess the current state of their productive systems and their communities, and to identify priority variables for changing to a desired state of the system.



Data collection as part of a research study in Yogyakarta, Indonesia © FAO/D. Colozza

Lastly, SHARP+ has been widely used in **academic and non-academic research** to conduct studies on climate resilience, sustainable agriculture and agroecological transition. This includes



research by institutes such as ETH-Zürich (Switzerland – [BOX 5](#)), the University of British Columbia (Canada), Wageningen University and Research (Netherlands), the National University of Costa Rica (Costa Rica), the University of Guadalajara (Mexico), the University of Nicaragua (Nicaragua) and the Universitas Gadjah Mada (Indonesia).

BOX 5

Use of SHARP+ in Guinea as part of a joint study between Mercy Ships, ETH-Zürich and FAO

The SHARP+ tool was used in a village in Guinea to assess the resilience of farmers in 2019. The research was part of a pilot project for Mercy Ships' Food for Life agricultural extension programme (FFL) and the outcomes were part of the dissertation thesis of a Master's student at ETH-Zürich.

Mercy Ships is a non-governmental organization (NGO) founded in 1978, working in the health sector in developing countries, particularly in Africa. The NGO visits one country per year to provide free healthcare to the population using a hospital-based boat. FFL aims to reinforce local capacities in nutritional and agroecological agriculture by providing agricultural training to about 30 people per country.

The FFL goal is to enhance climate resilience by building the capacity of farmers on agroecological practices and to increase information exchange mechanisms, using agricultural extension services.

In 2019, through FFL, Mercy Ships used SHARP+ to identify apposite training needs adapted to the local context by revealing the areas of low resilience and to develop the training on the identified issues.

To this end, SHARP+ was adapted by ETH-Zürich in collaboration with FAO, to select the relevant modules and contextualize the questionnaire. The customization of the tool taking into account the regional diversity within countries was paramount to ensure the identification of context-specific strengths and vulnerabilities. The field survey was implemented during the FFL 2018–19 programme and a total of 43 surveys were completed.

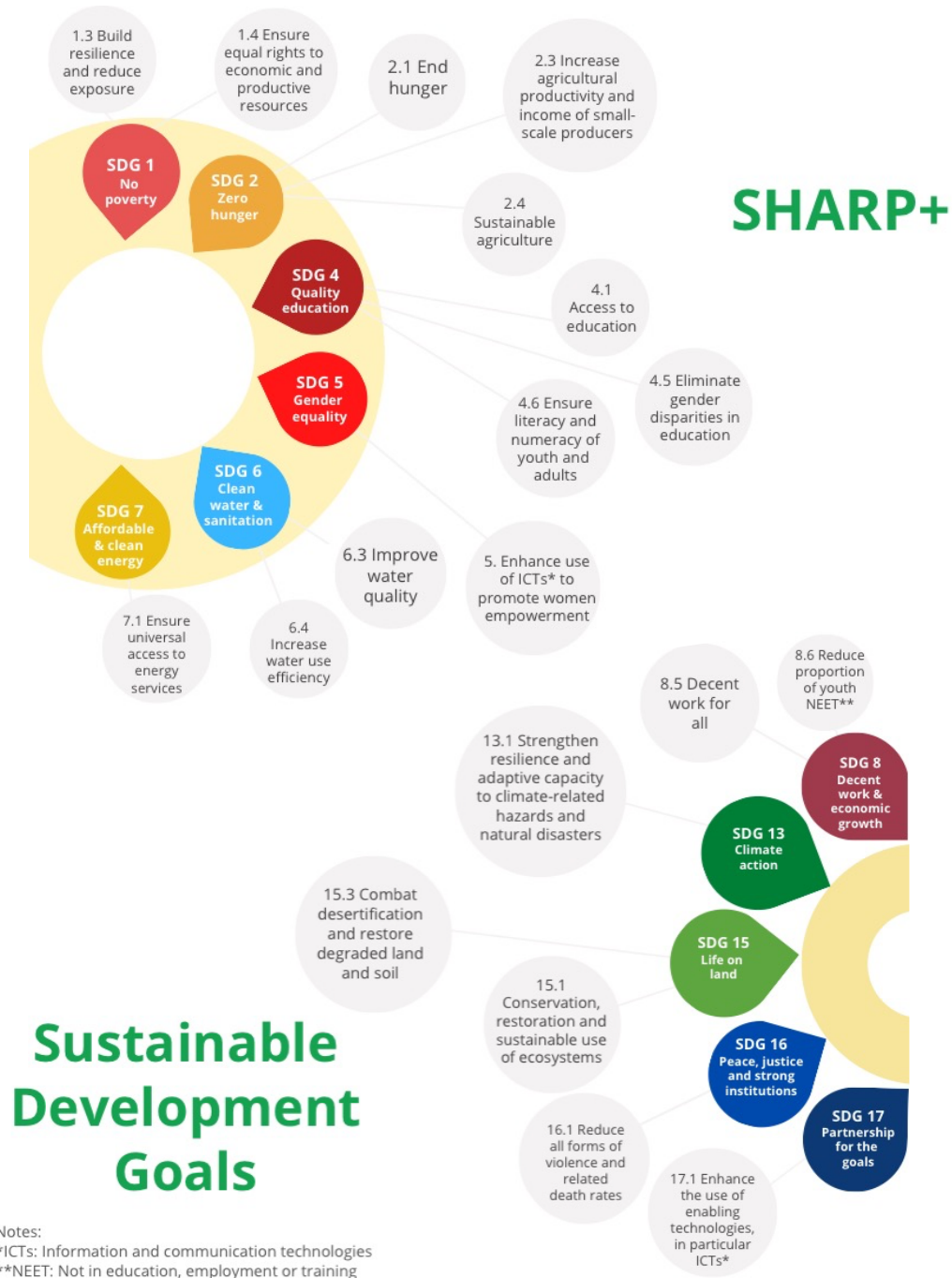
The SHARP+ assessment was key to identify and prioritize the actions needed to strengthen climate resilience of smallholder farmers. Features linked to lack of access to water for agriculture, limited information on water management techniques and scant knowledge of livestock production practices, as well as inadequate coping and adaptive strategies, constituted the main resilience gaps. Aspects related to access to information and valorization of the heritage of the elders were highlighted by farmers as priority issues for enhancing resilience. To ensure the validity of the results, they were discussed by village members, who confirmed their accuracy.

The use of a holistic approach to assess resilience, where agroecological practices and nature-based solutions are featured, also showed that the FFL programme, based on agroecology and access to information, would indeed have an impact on building resilience in the regions visited by Mercy Ships.

4.3 SHARP+ and the 2030 Agenda

The data collected through SHARP+ also contribute to the reporting requirements of the **2030 Agenda**, as the questionnaire gathers information on the Sustainable Development Goal (SDG) indicators and targets.

Figure 13. SHARP+ and the 2030 Agenda



5

SHARP+ in the field



This section shows in detail how to adapt the questionnaire to meet the objectives of the assessment, how to conduct a training, how to use the data that SHARP+ generates, and how apply it in different situations.

5.1 SHARP+ intended users

a) Who should use the assessment?

The overall SHARP+ assessment, including resilience measurement and its comprehensive results on rural livelihoods, are intended for development practitioners, comprising project formulators, managers, M&E experts, policymakers and researchers. The public in general, and farmers themselves, are also invited to use the assessment methodology. Nonetheless, there are technical requirements that might limit the use of SHARP+, such as an understanding of resilience and analytical skills to manage and/or interpret data.

b) Who should use the tablet application?

Originally, SHARP was designed for autonomous use by agricultural producers (i.e. crop producers, pastoralists, fishers, agroforesters) so that they would be able to self-assess the level of resilience of their own production systems. However, in practice, the independent use of SHARP and SHARP+ by farmers themselves has been limited, mainly linked to the literacy and IT requirements of the tool and the contexts in which it has been applied.

In only a limited number of countries and contexts has the tool been utilized as initially intended – for example, in Switzerland and Germany, where most farmers are (IT) literate, have sound access to mobile devices and electricity, and are well aware of technical concepts used in the

survey. Therefore, SHARP and SHARP+ tablet applications have been facilitated by field enumerators or researchers in most cases.

5.2 Defining the scope of the assessment

Conducting SHARP+ presents several advantages, the most important being access to up-to-date comprehensive household level data. Nonetheless, **before deciding to conduct any field-level assessment it is necessary to define a clear objective for using the tool.** There is no point collecting data that are not really needed, as this activity is often costly and time demanding.

To define the scope of assessment, practitioners should have in mind the **theory of change (TOC)** of the project. Namely, practitioners should know how (e.g. all the set of steps, interventions, stakeholders involved) and why (e.g. new links, innovative governance structures, new ways of working) a desired change is expected to happen in a particular context.

The questions below can help define the scope, objectives and need of the SHARP+ assessment.

Table 7. Guiding questions to define the scope and need of a SHARP+ assessment

Questions	Potential responses determining the need and the scope of a SHARP+ field assessment
Do we need to know the resilience levels of a given population? Why?	Short- and mid-term effects of project interventions on beneficiaries and community stakeholders can be measured and tracked over time.
What kinds of questions are we trying to respond to through the assessment? How will these contribute to learn what needs to be done (e.g. at project level)?	Increased understanding of rural livelihoods is needed to improve the definition of the interventions and targeting. The project needs to know how communities are accessing and using natural resources, what their main income sources are, whether farmers face restrictions to access markets, among others.
What kind of data do we need to have a holistic understanding of resilience of men and women?	Household-level data are needed that can be disaggregated by gender, age, ethnicity or by another socioeconomic characteristic.
Is there any up-to-date information already available (e.g. household surveys) that can help in assessing the resilience of households, for instance through other approaches and methodologies?	Household surveys or censuses exist but they are outdated (e.g. dated five years ago or more) or just present aggregated information not allowing for disaggregation (e.g. figures are presented for the whole country). No other methodologies or assessments have been implemented recently that indicate what the prevailing resilience levels of the targeted households are.



Questions	Potential responses determining the need and the scope of a SHARP+ field assessment
How are we going to use the information gathered?	<p>The data will inform the design of interventions and identify who is more in need.</p> <p>The data will serve to set an M&E system against which the progress towards the project’s objectives and overall goal can be tracked and assessed.</p>
How many resources (time, human and financial) do we have available for conducting a field level assessment?	The human resources are available (e.g. for data collection, analysis of results, reporting) and the financial funds (e.g. to cover the logistics, salaries if needed and other derived costs) have been secured for the assessment.

Once the objectives are set and there is a defined use of all the information to be gathered, the project team can plan the field-level assessment.

5.3 How to create a context-specific assessment and train staff

SHARP+ is a flexible tool that allows practitioners to fine-tune the questionnaire to fit the context in which the resilience assessment is carried out. This flexibility provides users with a wide range of options to tailor the tool to meet the project needs (e.g. developing M&E indicators, setting baselines), while having a robust tool to collect first-hand household-level data and conduct an assessment of climate resilience.

BOX 6

What can be modified in SHARP+ to contextualize it?

- Thematic modules – by selecting which of the optional modules are needed in the assessment.
- Questions within modules – to ensure they suit the population under assessment and the objectives.
- Response options – to increase relevance to the context and the objectives of the assessment.
- Language – including native or indigenous languages.

5.3.1 Adaptation of the tool

The SHARP+ questionnaire is built around a set of 17 core modules which capture households' resilience and aim to understand current strategies used by farmers to cope with and adapt to climate change and other non-climate shocks in a given location or specific group of study (e.g. Indigenous group, gender determined, agricultural practice). An additional 16 non-mandatory modules provide the opportunity to expand this understanding and deepen knowledge of aspects that are more relevant to the particular project and communities.

Adaptation involves up-front work to identify all the relevant modules, questions and response options, to ensure that the questionnaire is adequately adjusted to suit the local context. Six elements are essential to ensure that SHARP+ is well customized for use in the field as part of projects or research, six essential elements must be covered:

1. Understanding the questionnaire:

The project staff and/or researcher(s) must have a good understanding of the questionnaire. They need to be knowledgeable about the questionnaire content and the SHARP+ methodology for resilience assessment and must have a clear scope of the use of the tool based on a sound TOC as explained in [subsection 5.2](#).

BOX 7

What to look at when adapting SHARP+ to the local context

Over the past years, the SHARP team has identified a list of practices, situations and environments shared by different populations in the world and offered to users through standardized response-option lists. Cognizant of the diversity and particularities of each agro-ecosystem and populations within countries and regions, the SHARP team actively promotes a thorough review of such lists to offer practitioners a tool that captures the realities in the field in the most accurate way possible.

A standard list of responses can be established through focus group interviews with community members or based on a desk review to identify the following:

- **Seasonal and perennial crops and varieties** prevalent in the area, including local varieties, neglected and underutilized crops and newly introduced varieties (comprised, improved seeds).
- **Livestock species and breeds** raised by farmers, including crossbreeds.
- **Units of measurement** (metric or imperial system).
- **Land tenure situation** of smallholder farmers and the average size of agricultural holdings.
- **Tree species** grown by farmers and those present in neighbouring forests (if any).
- **Land, soil, water, energy and forest management practices.**
- **Climate and non-climate shocks** in the selected areas and any warning patterns forecasted for the areas under assessment.
- **Public initiatives** concerning sustainable agriculture and/or climate change adaptation.



2. Selection of appropriate modules: Among the non-mandatory modules, the project team should identify those relevant to the objectives of the project or research. For instance, if the project has a strong focus on land degradation, the team might select the modules “Soil and land quality and degradation” and “Landscape” to better understand the ongoing degradation processes, land and soil quality and land use. These will build on the core modules “Land management practices”, “Land access”, “Trees” and “Water access and management”.



Revision and adaptation of the SHARP+ questionnaire during the training in Tashkent, Uzbekistan
© FAO/M. Hernández Lagana

3. Reformulation of questions: Whenever needed, existing questions should be reformulated to suit the national/project site context, including the selection of response options such as crops (seasonal and perennials), animal species, tree species, land extension ranges, local food items, land, water and pest management practices available in the area (see BOX 7).

A suitability assessment should be conducted, covering aspects within the selected modules. The goal is to assess the extent to which the modules (questions and answers) collected are relevant to the context and populations under study, since specific behaviours, available assets and climate patterns may vary depending on circumstances and agroecological zones. For instance, there might be the need to judge whether to include the question on home granaries

based on the context (e.g. farms in sub-Saharan Africa, Latin America and Europe all have different needs and uses).

Consider that some questions may be sensitive in certain contexts due to culture and customs (e.g. number of animals linked to perception of wealth, food consumption patterns).

An assessment is required to establish whether there is a need to incorporate new specific questions or thematic modules not contained in the standard questionnaire. For example, a project with a specific focus on fish farming might wish to develop a new module in which fish production, nutrition and health are addressed.

Important: The staff or researcher need to achieve a good balance in terms of depth and length of the assessment when tailoring SHARP+. The addition of new questions and modules has implications for the length of the questionnaire, directly impacting the time needed for data collection and adjustment of the tool. Likewise, the longer the questionnaire, the more likely the data quality will decrease due to farmers' and enumerators' fatigue.

4. Translation: If needed, translation of the questionnaire into national and/or local languages should be carried out once the final version of questionnaire is developed.

5. Revision of scoring system: If new questions and/or modules are included, or existing ones are significantly modified (for example, to fit the context), it may be necessary to revise the scoring system and this should be done in close collaboration with the SHARP team.¹² In the former case, new scores might be developed and included as part of the resilience assessment; in the latter, existing scores and applicability rules might be modified to better fit the questions' needs and response options.

6. Deployment of the SHARP+ tablet application: Once the paper version of the questionnaire is created and approved by the technical team, national units and SHARP team, the latter builds a new SHARP+ application version. This activity usually takes place at FAO headquarters in the

¹² If revision of the scoring system is conducted independently from an FAO-led project, it is advised that the project team or researcher consult the SHARP team for quality assurance.



framework of major projects or studies.¹³ The version is tested for content relevance, potential bugs and technical issues prior to its facilitation in the field.

BOX 8

Summary of the steps to adapt SHARP+ to the local context and project needs

1. Understanding the questionnaire. National and technical team or researcher get acquainted with the content of the questionnaire and scope of use, based on a clear theory of change.
2. Selection of appropriate modules other than the core ones selected. Users identify main crops, livestock and trees, as well as all relevant response options suitable to the local context in which SHARP+ will be used.
3. Reformulation of questions. Questions, response options or modules are (re)formulated as necessary. New modules may be created to fully cover the needs of the assessment.
4. Translation. The questionnaire is translated to local/national languages if deemed necessary. A new paper version of the questionnaire is finalized.
5. Revision of the scoring system. The resilience measurement scoring system is revised and adjusted as needed based on the extent of changes made to the questionnaire.
6. Deployment of the SHARP+ tablet application. The SHARP team creates a new customized application version to be used for field data collection.

5.3.2 Organizing training on SHARP+

When SHARP+ is used as part of a project that entails significant data collection, the SHARP team usually provides training to national staff and enumerators upon request.

The three- to five-day training workshop aims at increasing the understanding of the SHARP+ methodology and its use. Training participants usually comprise the various stakeholders involved in the project, such as technical and operational staff (e.g. coordinator, M&E expert, enumerators), and national counterparts (e.g. Ministry of Environment, Ministry of Agriculture, research institutions). The training has the objective of developing stakeholders' capacity and building their skills to conduct field-level resilience assessments through SHARP+. The workshop also includes field-testing on the version created for the project and provides guidance on

¹³ If the tool is being customized for a research project, the user can independently follow the suggested steps to adapt the questionnaire and select the relevant modules. Core modules must always be included to ensure good alignment with the theoretical background of the tool, connecting the questions with the 13 agro-ecosystem indicators.

development of the workplan for data collection (see [Annex F](#) for a standard SHARP training agenda).



Training of project staff and enumerators in Dushanbe, Tajikistan © FAO/M. Hernández Lagana

The training also helps participants to gain an understanding of how to improve M&E for resilience building and adaptation. For instance, deals with how the tool responds to the project M&E needs, such as the definition and tracking of output and outcome indicators based on the project objectives and the information collected through SHARP+.

During the training, particular attention is given to the facilitation of the survey by enumerators, including sensitivity when asking the questions, translation of key terms into local languages and the management of expectations in order to ensure the collection of high-quality data.

The team usually recommends recruiting enumerators with previous experience in survey implementation and with some agricultural background to improve both understanding and facilitation of the tool.

The selection of suitable enumerators and their successful training will have a direct impact on the quality of the data and, hence, of the assessment. Enumerators with experience conducting household surveys and with good facilitation skills (e.g. ability to ask technical questions that are



both understandable for farmers and sufficiently precise to accurately reflect the realities in the field) will influence the results of the assessment.

In this regard, [Annex D](#) provides tips for facilitation of the SHARP+ survey and [Annex G](#) provides suggested terms of reference for recruiting enumerators. The training material is available on the website for independent users and researchers to refer to when carrying out autonomous training of enumerators.

The training also allows enumerators to develop a workplan for data collection. For this activity, the project M&E expert or researcher needs to have a clear idea of the sites to be covered by the project or study and of the number of households to be surveyed. The project or researcher therefore needs to have a sampling strategy in place to allow for the development of a data collection and submission plan for enumerators. This will also serve as a basis for the data analysis (see [subsection 5.4.2](#) for more details on data analysis).

BOX 9

Key points to consider when organizing training on SHARP+

- **Identify training participants.** Before conducting a SHARP+ training session, the national team should identify and recruit the enumerators who will be in charge of data collection, as they are the key participants in the training. There should be a gender balance among enumerators – essential when interviewing women (see [Annex G](#) for Terms of Reference of enumerators).
- **Customize the SHARP+ questionnaire.** The questionnaire needs to be adapted before the training ([subsection 5.2.1](#)), as the workshop will serve as an opportunity for fine-tuning based on the knowledge, skills and expertise of the participants.
- **Adapt training material.** The national and SHARP teams should adapt training materials (e.g. carry out translation of documents) and prepare the agenda based on the type and number of participants.
- **Test the questionnaire in the field.** Field-testing with farmers is essential during training. The activity gives enumerators the opportunity to test the tool with actual farmers, fine-tune the questions and responses, identify IT bugs and assess the time required to complete one survey.
- **Customize the SHARP+ tablet application.** During and after the training, the SHARP team compiles feedback and integrates suggestions in the questionnaire while the IT team addresses bugs. The final application is delivered to the field team within one week after the training.
- **Define the sample size and project sites.** The (indicative) number of surveys and project sites needs to be in place in order to elaborate the data collection plan (see [subsection 5.4](#) for more details).

5.4 Data collection, analysis and reporting



Group discussion in Bibala, Angola © FAO/T. Basterretxea

5.4.1 Data collection

Data collection usually takes place after the training using an adapted version of the tablet-based application. Fine-tuning of the application after the training takes about one week, depending on the extent of changes required. If they are not too extensive, the application can be ready right after the workshop.

a) Preparation of data collection plan

Once the project is under development, the broad sites (e.g. communities, regions, landscape) in which the project will intervene have usually been identified. Due to time and resources constraints, it is impossible to collect information on every single household located in the broad sites, and only a share of these households (i.e. a sample) will be interviewed.

The design of the sampling strategy (i.e. selection of the sample of households) is usually undertaken by the project M&E expert and national team (or researcher) based on the number of households located in the project areas, and on other selection criteria relevant to the project including socioeconomic characteristics (e.g. agriculture-reliant households, ethnic groups, land use type and tenure) and project objectives (e.g. management of forests, value chain development).



The sample size needs to be representative of the population within the area of study to ensure that conclusions can be drawn and generalized to a wider area with similar characteristics (e.g. overall project intervention area).

Usually **at least 30 percent of female-headed households are targeted** to capture gender-related patterns and allow disaggregation of the data during the analysis. It is important to note that the more disaggregation is requested (e.g. among different subsets of populations), the larger the sample required to ensure the scalability of the results. The sampling strategy is, therefore, a core element for data collection. The SHARP team can provide guidance for the design of the sampling strategy (see [Annex D](#) with a note presenting different sampling strategies) upon request.

b) Backstopping data collection

Based on the number of surveys, length of the questionnaire, and geographical and environmental characteristics of the areas under study (e.g. accessibility, season), the country team organizes the logistics and the enumerator's workplan is adjusted as needed.

The SHARP team usually supports the activity remotely to address any potential bugs on the tablet application and ensure correct data submission. Subject to internet connection availability, it is recommended to back up all surveys collected on a daily basis by downloading and storing them on the tablets, where they can be accessed without an internet connection.

5.4.2 Data analysis

Once all the data are gathered, they can be aggregated and analysed. The analysis requires basic statistical skills, knowledge on how to manage large data sets and familiarity with Excel. Ideally, the use of data analysis software (e.g. R, SPSS, Stata) would be an advantage for faster and more accurate processing and management of the data.

The first step consists in the quality assurance of the data collected in the field; the quality needs to be verified to ensure it is accurate. In practice, once all the surveys are duly filled in, it is important to check that applicability rules are correctly implemented to ensure consistency among responses; for instance, different types of land accessed cannot exceed the total area of land accessed (see [Annex D](#) for a guide on how to get acquainted with and manage SHARP+ data). Once the data are verified and quality is assured, the analysis follows.

The analysis consists of the thorough description of the information coming from the different question modules covered; it focuses on those aspects that contribute to the project's TOC and M&E system. The resilience assessment is performed following the methodology outlined in [subsection 3.7](#), where the areas of potential intervention are highlighted as well as the priorities

defined by the respondents. Guidance on how to calculate the 13 agro-ecosystem indicators is provided in [Annex D](#).

Data can and shall be disaggregated by gender of the household head and respondent, and by geographical area as needed. Since the data are collected at the household level, the gender of the respondent and of the household head is likely to reveal differences in resilience drivers, as well as in the perception of priorities and adequacy.

Disaggregation should also reflect project data needs, for instance, indicators that will need to be informed or the level of planning of project design. Other possible disaggregation levels include the production system (e.g. crop, livestock, agrosilvopastoral), land use type (e.g. cropland, rangeland, forestland) or income status or ethnic group.

The national team/researcher is encouraged to perform the analysis of the data to improve the accuracy of the interpretation of the results, as well as to promote full ownership of the methodology at different levels. In this case, a session on data management, interpretation and use of results would be part of the training, and technical guidance can be provided by the SHARP team during the analysis phase. Otherwise, the SHARP team can perform the analysis upon request and under a formal engagement.

5.4.3 Reporting

After completing the data collection, enumerators prepare a qualitative report to provide a context and improve interpretation of the results. Through the statistical analysis and qualitative report, the country/project team will develop the report of the assessment results.

As with the data analysis, it is highly recommended that the local team oversee this. The SHARP team can elaborate the report upon request and under a formal engagement. The report is reviewed by the national team to validate the results. It is advised to share the results with communities for corroboration and endorsement.

[Annex D](#) provides an outline of a standard report presenting SHARP+ results.



5.5 Using SHARP+ in combination with other tools

The data collected through SHARP+ are compatible with other data sources, including geospatial information and qualitative information from group discussions, transect walks or other assessment analyses.

a) Combination with geospatial information

SHARP+ surveys are georeferenced during data collection. Geospatial information gives essential information regarding the current status and evolution of natural resources, such as land use change, forest cover, deforestation and afforestation practices and Normalized Difference Vegetation Index (NDVI), as well as climate trends including precipitation and temperature changes. However, geospatial images themselves provide limited information about the causal factors of changes in trends, unless complemented with other information.

Using SHARP+ in conjunction with geospatial information supports ground-truthing satellite imagery and gives the user a better understanding of the main causes of the degradation or regeneration of natural resources. **BOX 10** provides an example of how SHARP+ can be combined with the results of other assessment tools such as LADA and Collect Earth throughout the project cycle.

b) Combination with qualitative information

The integration of SHARP+ with qualitative information from **group discussions** could guide the refinement of the survey during development and testing. Likewise, when used after the assessment, integration can support the validation and corroboration of the results obtained, guaranteeing that these reflect the realities of the communities in the field. The use of group discussions is vital for:

- **learning directly from project or study participants** what the priorities are so as to design interventions and identify whether priorities vary from one group to another (e.g. men and women have different needs);
- **detecting and understanding the main barriers and opportunities** in building climate-resilient production systems;
- **learning more about the current practices, knowledge, assets, resources and governance systems** that producers and communities have in place; and
- **gaining a better understanding of why certain practices** have been adopted or disregarded and what the project can do to boost or address these.

BOX 10

Example of the use of SHARP+ in combination with LADA and Collect Earth at different stages of the project cycle

a) During project formulation and before field activities start:

- **Screening households and communities.** SHARP+-assessed households with identified land degradation issues can contribute to the screening of communities where a Land Degradation Assessment in Drylands (LADA) is more needed (soil/land modules of SHARP+ could be reviewed and adjusted by the LADA team as necessary).
- **Validating and triangulating data.** SHARP+ household data support the verification and further exploration of information collected through LADA (households vs communities). As SHARP+ is georeferenced, the data also help to ground-truth satellite imagery collected through geospatial tools, such as Collect Earth, particularly in those areas where land degradation is a concern (“hotspots”).
- **Guiding activities at watershed/local level.** Reports can be prepared at watershed level to be used by farmer field school facilitators, LADA staff or other field project staff and to develop contextualized strategies at different levels.

b) Throughout the project:

- **Refining interventions.** SHARP+ assessment results can be discussed and validated with communities during LADA sessions to define and refine activities and interventions.
- **Monitoring interventions.** A SHARP+ mid-term survey could be used to feed into monitoring project indicators. Selected SHARP+ variables could be displayed onto Collect Earth hit map images useful for decision-making.

c) Towards the end of the project:

- **Understanding resilience levels and behaviour.** The evolution of resilience scores and priorities throughout the project life cycle is studied, collating with Collect Earth data and LADA assessments.
- **Assessing impact.** Progress is tracked against selected indicators, in accordance with the monitoring and evaluation system. Questions are asked, such as: How was land degradation reduced and soil quality improved as a result of project interventions? How did resilience levels change and why?

Group discussions allow practitioners and researchers to gain inside knowledge on how resilience is built at the community level. This in turn allows for a more participatory and inclusive decision-making process when designing resilience-building strategies and identifying the policies needed to enhance climate resilience through an integrated, inclusive and sustainable approach.



BOX 11 describes how SHARP was used in combination with focus group discussions in South Sudan. A guidance note on “Sharing the results with communities” is included in [Annex D](#).

BOX 11

Example of integration of SHARP results with group discussions in South Sudan

SHARP was used as part of the **Building Resilience and Adaptation to Climate Extremes and Disasters (BRACED)** programme funded by the British Department for International Development (DFID) and implemented by Concern Worldwide and the Agency for Technical Cooperation and Development (ACTED), in collaboration with technical partners including FAO.

SHARP was used in 2015 to conduct the diagnostic baseline assessment to identify ongoing resource management practices in the field and the resilience hotspots for the design of interventions. The tool was then used in 2018 to perform the project evaluation. The baseline and endline survey results were combined with qualitative interviews and focus group discussions to gain knowledge regarding on-the-ground interventions, from the experience of beneficiaries and stakeholders.

The qualitative information gathered through interviews and discussions was invaluable not only for the design of the interventions based on identified priorities, but also to assess “the programme’s successes, and to show how the quantitative SHARP data and qualitative survey findings can work together to build understanding in ways that neither can do alone” (BRACED, 2018, p. 17).

The integration of both types of information showed that climate resilience measurement is highly complex and relies on the simultaneous consideration of individual, community and institutional factors. The integration of different assessment methods is paramount.

For instance, the assessment revealed that participants in the pilot study showed particularly weak resilience levels in the aspects linked to animal disease management practices and access to veterinary services. As such, the project targeted these (among others) as part of their core interventions. By the end of the project, households showed an increased technical score in these aspects, indicating better access to these services for participants’ households thanks to the project’s interventions. However, households reported in the final community consultation that they perceived this to be less adequately addressed than before the start of the project. Interestingly, it was also reported that this increase in perceived need may have been the result of the improvement in knowledge and awareness around issues of animal husbandry following BRACED community training (BRACED, 2018).

The project found that in-depth interviews as SHARP+ were of great value to gain detailed knowledge on resilience and its drivers. **It was also noted and suggested that the** findings gathered through community direct feedback are highly relevant to the monitoring and evaluation of climate resilience programmes in humanitarian contexts **in which researchers and practitioners**

To support the combination of SHARP+ with other assessment tools, information about specific aspects the project intends to address (e.g. food security status, land degradation, climate risks) can be integrated in the SHARP+ survey and complemented with questions during the group

discussions. The analyst thus gains details on the matter under study that they would not learn from a household-level assessment or satellite data alone.



Field training of programme staff from organizations under the BRACED consortium (FAO South Sudan, Concern Worldwide, ACTED and The Sudd Institute) in Juba, South Sudan © FAO/D. Colozza

As noted, SHARP+ can be used as a part of an ex-post monitoring and/or evaluation system to provide information about the impact of project activities on climate resilience and other social and environmental development outcomes. In combination with group discussions in the evaluation phase, it is possible to learn directly from participating communities whether and how project strategies influenced their livelihoods (in any direction) and what improvements can be made in the future.



5.6 Time requirements when incorporating SHARP+ in a project

Depending on the sample size and whether SHARP+ is integrated with other tools, the Implementation process usually takes between two and four months; this includes data collection, which usually takes three to six weeks.

Figure 14 presents a summary of the flow chart for using SHARP+ from the beginning of a project through to the end, envisaging an evaluation. It depicts the different steps required for its incorporation in projects, the stakeholders involved, and the main outputs expected.

Figure 14. Process flow chart for using SHARP+ from the beginning to the end

Phase	Steps	What will you need?	What will you get?
Phase 1. Planning the assessment	<p>1. Planning</p> <p>Estimated time: 2–3 weeks</p> <ul style="list-style-type: none"> Identify national SHARP team (M&E expert, enumerators), including selection of sites, budget¹ for the assessment activities, logistics. Address training needs (support from SHARP FAO-HQ team upon request). Review of the questionnaire – Selection of relevant modules, customization to context (e.g. crops, trees, ethnic groups), translation (national, local languages), alignment to the log frame and TOC. 	<ul style="list-style-type: none"> M&E expert of the project and recruitment of enumerators Procurement of Android tablets (one per enumerator) SHARP team to organize training (if needed) 	<ul style="list-style-type: none"> Agreed project- and community-relevant tool questionnaire for resilience assessment and comprehensive rural livelihoods understanding Approved workplan for data collection and assessment (e.g. training, budget, sample)
	<p>2. Desk-based information</p> <p>Estimated time: 1–2 weeks</p> <ul style="list-style-type: none"> Gather information on number of agricultural holdings, rural population, main livelihoods to prepare the sample selection and workplan. Depending on scope, undertake a mapping exercise of land use systems to select households. 	<ul style="list-style-type: none"> Agricultural census or surveys at country and/or subnational level Administrative records to determine the number of households in the project area 	

Phase	Steps	What will you need?	What will you get?
Phase 2. Assessment: Identifying and prioritizing risks and opportunities	<p>3. Initial stakeholder engagement</p> <p>Estimated time: 1–2 weeks</p> <ul style="list-style-type: none"> • Liaise with national and subnational stakeholders and project officers. • Train relevant parties and enumerators on SHARP+ methodology, use and facilitation of the survey for data collection, interpretation of results. • Finalize the tailored application for use in the field. 	<ul style="list-style-type: none"> • SHARP team to facilitate the training (if needed) • Venue to conduct the training workshop • Team of enumerators for data collection • Group of farmers for field-testing 	<ul style="list-style-type: none"> • Comprehensive data set at the household level on rural livelihoods for project target areas • Key household and farm systems resilience-related issues identified
	<p>4. Resilience assessment in the field</p> <p>Estimated time: 3–5 weeks</p> <ul style="list-style-type: none"> • Use mapping and advice from stakeholders to guide selection of site surveying. • Address local authorities and leaders for consent and household selection. • Collect the data in the selected areas. 	<ul style="list-style-type: none"> • Transportation and travel expenses for field team • Communities • Compensation for farmers if foreseen 	<ul style="list-style-type: none"> • Extensive report to inform the development of project interventions produced • Baseline data of relevant project indicators provided
	<p>5. Data analysis: prioritization of risks and opportunities for resilience building</p> <p>Estimated time: 2–3 weeks</p> <ul style="list-style-type: none"> • Analyse and interpret the data: Identify the areas with low and high resilience scores (based on objective information and self-assessments). • Combine SHARP+ data with other type of information (e.g. geospatial). • Produce comprehensive report of results. • Hold discussion with project staff and national stakeholders (including communities) for validation. 	<ul style="list-style-type: none"> • Venue to conduct the validation workshop (if applicable) • Transportation and travel expenses for field team (if applicable) 	



Phase	Steps	What will you need?	What will you get?
Phase 3. Action and monitoring plans	<p>6. Informing interventions and monitoring plans</p> <p>Estimated time: 3–4 weeks</p> <ul style="list-style-type: none"> • Complete monitoring plans with the identified indicators linked to resilience levels and relevant to the project's logical framework and TOC. • Share and discuss monitoring and action plans with key internal staff, technical units and external stakeholders (e.g. national stakeholders, donors) to develop and validate suitable interventions. • Develop a shortened version of SHARP+ to track project interventions exclusively. 	<ul style="list-style-type: none"> • M&E expert of the project and project team • Stakeholders engaged in project implementation and reporting • SHARP team to develop shortened version (if needed) 	<ul style="list-style-type: none"> • Prioritized areas of work (thematic and geographical) by stakeholders • Project documents informed with primary data • Monitoring plans
	<p>7. Monitoring activities</p> <p>Estimated time: duration of the project</p> <ul style="list-style-type: none"> • Continue engagement with stakeholders; share regular progress reports through midline and endline data collection activities. 	<ul style="list-style-type: none"> • M&E expert of the project and project team • Stakeholders engaged in project implementation and reporting 	<ul style="list-style-type: none"> • Regular project monitoring reports
Phase 4. Process and impact evaluation	<p>8. Evaluation plans</p> <p>Estimated time: 4–6 weeks</p> <ul style="list-style-type: none"> • Carry out refresher training of relevant parties and enumerators on SHARP+. • Perform resilience assessment at the end of the project using the SHARP+ customized country and selected indicators. • Undertake group discussions to validate results and learn from the outcomes of the project. • Produce endline report. 	<ul style="list-style-type: none"> • SHARP team to organize a refresher training (if needed) • Venue and tablets • Enumerators and facilitators • Communities • Compensation for farmers if foreseen 	<ul style="list-style-type: none"> • Midline and/or endline data • Information on changes and project's impact • Project participants' views on the interventions' success

Notes:

M&E – monitoring and evaluation; TOC – theory of change

¹ Subsection 5.7 provides details on how to budget for a SHARP+ assessment.

5.7 How to budget for a SHARP+ assessment

Conducting a field-level assessment is usually costly as it involves the mobilization of human resources. The costs will be tied to the size of the sample to be interviewed and other conditions (e.g. topography, season of data collection), as these will influence the time required to collect data.

Thus, the costs of the assessment from start to finish will vary from one country/project to another depending on several factors. **Table 8** contains a list of items to consider and budget for when planning a SHARP+ assessment in the field.

Table 8. Items for consideration in a budget to implement SHARP+

Item	Considerations
Training	
Trainers	FAO's SHARP team can provide training to project staff upon request.
Travel	Travel costs need to be allocated for on-site training (if applicable).
Venue	Rental of a venue to gather participants and catering services.
Equipment/supplies	Stationery and other material needed (e.g. projector, microphone).
Translation	Translation and interpretation costs might be needed before (for training material) and during the training (for presentations).
Field activities	
Enumerators	Subject to sample size. Usually, three enumerators are hired for samples over 200 households.
Tablets	Sufficient amount allocated to purchase tablets for enumerators. The number of tablets will correspond to the number of enumerators (i.e. one tablet per enumerator).
Transportation costs	Car rental, oil, food allowances need to be factored in.
Compensation to farmers	If envisaged, in-kind support or cash could be given to farmers in compensation for the time taken.
Data analysis and reporting	
Data analysis	1–2 weeks of work. FAO can provide support upon request.
Reporting of results	1–2 weeks of work. FAO can provide support upon request.

The field project team might need support from the SHARP team to conduct some activities, such as the training of enumerators, data analysis and reporting of results. **Table 9** provides an itemized budget estimate for support from the team.



Table 9. Estimated budget for SHARP team support

Step/Item	Number of units	Unit	Unit cost (USD)	Total cost (USD)
Adaptation of survey to project needs				
Tool customization, including IT	4	days	250	1 000
Subtotal				USD 1 000
Field training (on site)¹				
Per diem	5	days	200	1 000
Honorarium	5	days	250	1 250
Travel for trainers (1 trainer)	1	ticket	1 500	1 500
Subtotal				USD 3 750
Data analysis and reporting				
Sampling strategy	1	days	250	250
Data collection backstopping	3	days	250	750
Data analysis	6	days	250	1 500
Report writing	6	days	250	1 500
Subtotal				USD 4 000
Estimated cost for SHARP team support				USD 8 750

Note: ¹Shorter virtual trainings can also be organized.

5.8 Data storage and private policy

All the data collected with SHARP through FAO-led projects are stored in a central server managed by FAO's IT division. Data – other than contact, personal or registration information – provided when using or generated through FAO Applications will be processed by FAO and/or its authorized vendors or subcontractors and may be made available to third parties for the purposes of presenting and/or aggregating information for further analysis.

The projects and governments own anonymous data, which can be shared and used afterwards for research or the development of new projects. Comprehensive project reports are available to project partners and donors with the main results. Selected case studies and academic articles are available to the public through SHARP's corporate webpage <http://www.fao.org/in-action/sharp>.

According to the privacy policy for use of FAO applications:

all information processed through FAO databases will be processed by FAO in accordance with FAO's rules, policies and practice, to the exclusion of any single national system of law (FAO, 2021).¹⁴

Anonymized information is available to academia or research institutions upon request to the SHARP team and upon approval of the authorities concerned (in the case of information collected in collaboration with a public entity such as local or national government).

When SHARP+ is integrated as part of research activities, data are owned, managed and processed by the research institutions in compliance with the Terms and Conditions for the Use of an FAO Application. By using an FAO Application, the user acknowledges and agrees his/her responsibility for obtaining the prior informed consent of the owner of the personal data gathered. If data are submitted to FAO's central server, FAO has the right to use and process it.

5.9 Final considerations on the implementation of SHARP+

It is important to note that the length of the process of implementation will vary depending both on the purpose for which the tool is used and on the context in which it is implemented.

If SHARP+ is used for conducting a diagnosis analysis (baseline) and/or for evaluation purposes, the organization of group discussions among prospective or current beneficiaries – for instance, women and men, ethnic groups in the areas of interventions, land users and land use types – is strongly advised (see [subsection 5.5](#) for the use of SHARP+ in combination with other tools).

When SHARP+ is (also) used for monitoring purposes throughout the project, it is recommended to use a shortened version of the tool comprising only those modules strictly relevant to the project for tracking track specific output/progress indicators, such as number of sustainable practices being used to manage land or the percentage of people with access to community cereal banks. The use of a shortened questionnaire would reduce the time and financial resources required for data collection, while still retrieving key information to report on the project's performance.

¹⁴ For more information, please refer to the Private Policy available at <http://www.fao.org/contact-us/privacy-policy> or contact Copyright@fao.org.



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Glossary

Adaptive capacity. The set of strengths, attributes and resources available to households and communities to deal with and respond to shocks and variability, with focus on longer-term and sustained adjustments (Gallopín, 2006).

Climate change. A variation in climate that is attributed directly or indirectly to human activity and which alters the composition of the global atmosphere (e.g. through increased carbon dioxide, nitrous oxides and methane), adding to the natural climate variability observed over long and comparable periods of time (UNFCCC, 1992).

Exposure. Used to refer to the presence (location) of people, livelihoods, environmental services and resources, infrastructure, or economic, social or cultural assets in places that could be adversely affected by physical events and which, thereby, are subject to potential future harm, loss or damage (Lavell *et al.*, 2012).

Evaluation. The process of determining the extent to which extent the outcomes and expected impacts have been achieved, as well as the effectiveness, efficiency, relevance and sustainability of interventions. Evaluations also allow to assess the extent to which the results achieved can be exclusively attributed (or not) to the interventions, processes and strategies.

Monitoring. The regular tracking (e.g. monthly, yearly, bi-annually) of inputs, activities, outputs and outcomes and of impacts of activities implemented by projects, programmes or strategies at different levels. Monitoring activities have the objective to regularly inform stakeholders about the extent to which planned activities have been implemented, which outputs have been achieved, and which challenges are emerging during the programme implementation that need to be addressed accordingly.

Resilience. The ability of a system and its component parts to anticipate, absorb, accommodate or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration or improvement of its essential basic structures and functions (IPCC, 2012).

Sensitivity. The understanding of the nature of vulnerabilities, i.e. the predisposition to be adversely affected due to the internal characteristics of what is being affected (Lavell *et al.*, 2012).

Social-ecological system (SES). An ecological system (including living organisms and non-living components within an ecosystem) connected with and affected by one or more social systems (Anderies, Janssen and Ostrom, 2004). The term social-ecological is preferred to socioecological, because the former emphasizes the equal importance of both subsystems, while the modifier “socio” suggests a status where the social subsystem is less important (Berkes,2017).

Theory of change (TOC). A detailed description and illustration of how and why a desired change is expected to occur in a particular context. In development programmes, it is centred on disentangling what the programme will do (i.e. all the activities and interventions) and how the strategy will lead to the achievement of the desired goals.

Vulnerability. The propensity or predisposition of someone or something to be adversely affected (IPCC, 2012; Lavell *et al.*, 2012).



Annexes

Annex A

Technical revisions of SHARP and SHARP+

Since first implemented in the field in 2015, the SHARP team has conducted two major technical reviews – in 2017 and 2019 – to incorporate the lessons learned in the field and to address the most important technical challenges, including those related to application performance. In early 2020, the team also carried out a qualitative evaluation of the tool to understand how it had been used since its major revision in 2017, the extent to which it had benefited projects, research and the beneficiary communities, and the areas to be improved.

This section presents how these technical reviews were undertaken, the main lessons learned through these and the evaluation and how SHARP has evolved to bring practitioners and researchers a better tool for resilience assessment.

A1. First technical review

Two years after its release, SHARP had been incorporated in 16 projects mainly in sub-Saharan Africa and the Sahel. Collaborations with universities in Latin America and Europe also took place, enabling SHARP to be incorporated in resilience research. Thanks to the rapid uptake of the tool and the variety of contexts in which it had been applied, the team noticed recurrent challenges that motivated the first major technical review of the tool at the end of 2017.

The first step of the technical review involved examining the standard 54-module SHARP questionnaire. It was assessed to identify any questions that could be considered irrelevant in addition to redundancy across and within modules. The result was a reduction in the length of the questionnaire – an aspect that had been indicated as an area of concern by several users. Some question modules were shifted to improve the content flow, while the applicability options were refined to ensure the accuracy of the results and reduce the length of the data collection by avoiding “unnecessary” demands. As a result, an initial set of modules and questions were therefore identified as for keeping or removal from the questionnaire.

The second step of the review involved comparing the different SHARP versions created for projects to assess the extent to which specific modifications to the questionnaire made in consultation with the project team could be used to improve the standard SHARP questionnaire. About seven different project-tailored versions were revised, including: the version developed for Angola with a strong focus on land degradation and agropastoral communities; the adapting irrigation to climate change (AICCA) version comprising four different questionnaires for assessing resilience of smallholder farmers and small-scale irrigation systems in West and Central Africa, and the versions created for the Gambia and Uzbekistan with a focus on forest management and production of timber and non-timber forest products. The evaluation project reports (e.g. the Building Resilience and Adaptation to Climate Extremes and Disasters [BRACED] programme in South Sudan¹⁵) and back-to-office reports of multiple training workshops were also considered in order to explore the gaps present in the questionnaire and the mobile application itself. This step helped the team to include further feedback directly from the field and from its partners.

The third step of the review entailed the consultation of other tools, such as Women's Empowerment in Agriculture index (WEIA) of the International Food Policy Research Institute (IFPRI),¹⁶ FAO's sustainability assessment of food and agriculture systems (SAFA)¹⁷ and food insecurity experience scale (FIES),¹⁸ the World Census of Agriculture (WCA),¹⁹ Land Degradation Assessment in Drylands (LADA)²⁰ and Living Standards Measurement Study (LSMS).²¹ This step allowed the team to gain a better understanding of how specific dimensions, such as women empowerment, community engagement and sustainability, were captured, addressed and measured through the use of household-level questionnaires. Acknowledging the value and pertinence of these tools, relevant questions from these were reframed, reformulated and incorporated in SHARP+ as part of the assessment.

These steps resulted in the development of the first draft of the new SHARP questionnaire, named **SHARP+**.

¹⁵ BRACED final evaluation report is available at <https://www.concern.net/insights/resilience-results-braced-final-evaluation>

¹⁶ WEIA is available at <https://www.ifpri.org/project/weai>

¹⁷ SAFA is available at <http://www.fao.org/nr/sustainability/sustainability-assessments-safa/en/>

¹⁸ FIES is available at <http://www.fao.org/in-action/voices-of-the-hungry/fies>

¹⁹ WCA is available at <http://www.fao.org/world-census-agriculture/wcarounds/wca2020>

²⁰ LADA is available at <http://www.fao.org/land-water/land/land-governance/land-resources-planning-toolbox/category/details/en/c/1036360/>

²¹ LSMS is available at <https://www.worldbank.org/en/programs/lms>



SHARP+ new scoring system

After the selection of questions and modules to include in SHARP+, the questions were carefully mapped and assigned to one or more of the 13 agro-ecosystem indicators for resilience assessment to ensure the assessment was effectively covering all resilience components as outlined by Cabell and Oelofse (2012).

The scoring system of each question module was thoroughly reviewed to improve its robustness in assessing resilience. For any new questions included, new scores were developed. The new and modified scores were set based on their alignment with academic discussions and ongoing international dialogues and processes regarding resilience, sustainability and climate action (e.g. Alkire *et al.*, 2013, Douxchamps *et al.*, 2017; FAO, 2014), including Sustainable Development Goals (SDGs) and climate-smart agriculture (CSA).

The questionnaire of SHARP+ and the corresponding scoring system were finalized in the last quarter of 2017 and circulated for technical validation. Both were reviewed by technical experts and units within FAO, including the Pest and Pesticide Management team (NSPCD), the Ecosystem approach to crop production intensification/ Agroecology team (NSPED), the Land and Water Division (NSL) and the Animal Production and Health Division (NSA), as well as funding liaison units hosted by FAO, such as the Global Environment Facility (GEF) nested in the Office of Climate Change, Biodiversity and Environment (OCB). Inputs from the various experts were carefully incorporated, while striving to keep a good length–content balance.

The technical validation exercise aimed to endorse the new SHARP+ questionnaire, especially for topics that were previously unaddressed (i.e. animal housing, access to forests, farm-level decision-making, food insecurity measurement and involuntary resettlement and displacement), for the refinement of questions, response options and the scoring system.

SHARP+ tablet-based application

Following the finalization of the new questionnaire and scores, the next step consisted in the development of a new SHARP+ application, using an existing and easy-to-use platform or “survey builder”. The main reason for changing platforms was the need for additional flexibility to customize the tool with increased autonomy of the SHARP team, as well as to reduce the reliance on IT support to release new questionnaire versions. Overall, this would diminish the time required to adapt the tool to different contexts and reduce the IT-related costs of adaptation for projects and users. By choosing a platform allowing modifications to be done by the SHARP team itself, the team would also be able to tailor and translate the tool, rapidly integrating the feedback from enumerators after field-testing during field missions.

The SHARP team worked from July to August 2017 to identify a solution to fulfil the above needs. Following the guidance of FAO's Digitalization and Informatics Division (CSI), the SHARP team decided to use the KoBoToolbox platform as the basis of its new SHARP application. The form.io platform was deemed suitable because:

- it is flexible to create and customize the questionnaires with a high level of independency;
- it is easy to use so the SHARP team could manage the forms and address any potential mistakes in the questionnaire and change applicability options in real time;
- it allows the inclusion of complex scoring in the forms, thus accelerating the time needed to calculate and visualize the resilience scores on the tablets and when exported to CSV or Excel files; and
- it is flexible enough to add new languages and translate the different questionnaire versions relatively quickly.

The first prototype of the SHARP+ application for use in the field was deployed in 2018 and piloted in Uganda and Burundi during the formulation of two GEF-funded projects. Although the testing phase involved several challenges – mostly connected to GPS registration, the offline feature for data collection and data submission to the FAO central server – CSI provided the necessary support. Between 2018 and 2019, 16 new versions were created for projects using the platform (<https://sharp-dev.surge.sh>).

With the new revamped SHARP+ questionnaire and application, new reference and training materials were developed and made available in English and French.²² In collaboration with project partners, selected material was also translated into Portuguese, Russian and Spanish in response to users' demands and training needs.

A2. Second technical review: SHARP implementation and continuous development

After its launch in 2017, SHARP+ was used as part of 16 new projects in sub-Saharan Africa, Central Asia, Europe, Southeast Asia and Latin America with a focus on climate change adaptation, sustainable agriculture and integrated resource management. The tool was

²² Reference material is provided in Annex C and is available on the website: www.fao.org/in-action/sharp



translated into ten different languages²³ and data was collected for more than 4 000 farmers worldwide.

In 2019, the GEF started a new programmatic/funding framework (GEF 7²⁴) and FAO was selected as the leading agency to implement its new Dryland Sustainable Landscapes Impact Programme (DSL-IP). Simultaneously, the preparatory activities for two new GEF 7 projects financed under the Least Developed Countries Fund (LDCF) in Zambia and Togo were underway. SHARP+ was chosen in both the DSL-IP and the LDCF projects as the main tool to collect socioeconomic household data and to assess smallholders' resilience in project sites in Angola, Botswana, Malawi, Namibia, the United Republic of Tanzania, Togo, Zambia and Zimbabwe.

The need to meet the requirements of the new Impact Programme and the LDCF projects motivated the second technical review and provided a unique opportunity to further refine SHARP+. In close collaboration with the SHARP team, the tool underwent a comprehensive review by FAO's Forestry Division and Agricultural Development Economics Division, as well as by the former Strategic Programme on Rural Poverty Reduction (SP3), the GEF unit and the eight country offices in which the projects are implemented.

The main areas of improvement identified were enhanced alignment of the tool with land and forest degradation phenomena, including management practices, and the need to feature further socioeconomic aspects linked to poverty analysis and women's empowerment. Other technical aspects of the application itself were taken into account, mostly focused on the interconnection of household data with spatial/geographical information gathered through remote sensing.

To respond to these needs, the SHARP team studied existing methodologies on relevant topics, including the conceptual framework of SDG indicator 2.4.1 on the proportion of agricultural area under productive and sustainable agriculture, IFAD's Multidimensional Poverty Assessment Tool (MPAT),²⁵ FAO's national socioeconomic surveys in forestry,²⁶ and FAO's operational guidelines

²³ SHARP+ is available in English, French, Spanish, Portuguese, Russian, Swahili, Uzbek, Tajik, Vietnamese and Indonesian.

²⁴ GEF 7 is a four-year investment cycle that aims to support the safeguarding of forests, land, water, climate and oceans worldwide, as well as help build green cities, protect threatened wildlife and tackle new environmental threats like marine plastic pollution. For more details, refer to: <https://www.thegef.org/documents/gef-7-programming-directions>

²⁵ MPAT is available at <https://www.ifad.org/en/web/knowledge/publication/asset/39631564>.

²⁶ National socioeconomic surveys in forestry are available at <http://www.fao.org/3/a-i6206e.pdf>.

for the design, implementation and harmonization of monitoring and evaluation systems for climate-smart agriculture (CSA).²⁷

Based on the 2019 review, the tool was fine-tuned and adjusted to include, *inter alia*, information on:

- access to forest resources and forest management practices;
- status of forests, use of forest products, including non-timber forest products (NTFP);
- presence of ongoing community initiatives to improve forest management;
- aquaculture and fishing practices;
- inclusion of a household roster to allow identification of household members' involvement in agricultural and non-farm activities and sex/age disaggregation; and
- optional modules on FIES, involuntary resettlement and displacement and housing characteristics.

Moreover, a version of the SHARP+ application supported by the platform Collect Mobile was developed to enhance the connection between household-level data collected through SHARP with satellite imagery compiled through Collect Earth.²⁸ Ultimately, this would support ground-truthing satellite imagery on land use change and resource-level trends with field-level information.

The 2019 review resulted in eight new country and project-tailored versions of SHARP+, which were operationalized using both the FAST and the Collect Mobile platforms.²⁹ In 2021, the questionnaire has been moved to the KoBoToolbox due to internal FAO institutional decisions.

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²⁷ CSA operational guidelines are available at <http://www.fao.org/3/ca6077en/CA6077EN.pdf>.

²⁸ The development of the Open Foris application Collect Mobile was a strategic decision supported by FAO's GEF unit as the integration of georeferenced data with Collect Earth was envisaged during project formulation.

²⁹ The SHARP version for Togo was created using the FAST platform developed by FAO's Information Technology Division CIO; the application was already available in French and the standard questionnaire was better aligned to project's needs. Two new modules on aquaculture and fishing practices were created in collaboration with FAO country office in Togo.



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Annex B

SHARP+ 2020 questionnaire

The questionnaire is divided in five sections:

- agronomic practices (grey),
- environmental aspects (green),
- social interactions (blue),
- economic components (red); and,
- governance (yellow).

Important considerations:

The modules whose titles are marked with an asterisk are **core/mandatory**. Within these, the asterisked questions are also compulsory.

17 mandatory (excluding general info) and 16 optional = 33 modules in total

The modules whose titles do not have an asterisk are **optional** and to choose from if desired. The asterisked questions within these are compulsory in case these modules are selected for use.

Module 2 “Household” determines the applicability of modules related to crop and animal production depending on whether or not any household member is engaged in these activities. Namely:

- If at least one household member participates in crop production, the modules below will become applicable to the ongoing household assessment:
 - *Module 5: crop production;
 - Module 6: weed species and management;
 - *Module 7: pest management practices; and
 - Module 32: Decision-making (farm management).
- If at least one household member participates in animal production, then the modules below will become applicable to the household being assessed:
 - *Module 8: animal production practices;
 - Module 9: animal breeding practices;
 - Module 10: animal nutrition and health; and
 - Module 32: subsection “decision-making (farm management).

*1. General information (core module)				
*Respondent’s name or ID				
*Sex of the respondent	Male	Female		
*Age of the respondent				
*Who makes most decisions in the household?	You	Your spouse	Both	Someone else (specify)
*Are there other decision-makers in the household?	No	Yes, another adult female decision-maker	Yes, another adult male decision-maker	
*Do you self-identify as belonging to an Indigenous/tribal group?	Yes		No	
*Geographical location				
*Province/region text				
*District text				
Village/community text				
*GPS	Latitude	Longitude		



*Questionnaire starting date (form metadata)	DD/MM/YYYY
--	------------

*2. Household characteristics (core module)					
*2.1 How many people live in your household?					
*2.2 How many of them are women?					
*2.3 How many of them are girls under 15?					
*2.4 How many of them are boys under 15?					
*2.5 How many of them are women between 15 and 24?					
*2.6 How many of them are men between 15 and 24?					
*What is the highest educational level of the household head?	Elementary /primary school		Secondary school		
	High school		Vocational training		
	Tertiary education (e.g. university)		Other informal training / education	None	
*Do girls go to school? 2.3>0	Yes, all of them	Only some	No		
*Do boys go to school? 2.4>0	Yes, all of them	Only some	No		
*Are women youth (aged between 15 and 24) in the household in employment, education or training? 2.5>0	Yes		No		
*Are men youth (aged between 15 and 24) in the household in employment, education or training? 2.6>0	Yes		No		
*Have male adult household members (over 25 years) completed any education programme or training? (e.g. agricultural training, vocational training)	Yes		No		
*Have female adult household members (over 25 years) completed any education programme or training? (e.g. agricultural training, vocational training)	Yes		No		
*In the last 2 years, has any women migrated to find work elsewhere?	Yes		No		
*In the last 2 years, has any men migrated to find work elsewhere?	Yes		No		
*Do elders (or experienced people living in your household) contribute to the education of children? (e.g. traditional cultivation techniques, prediction of weather events, reading/writing)	Yes		No		
*How many in the household are unable to work due to health/age reasons?					
*In the last 2 years, how has the overall health of the majority of the people in your village/area changed?	Improved a bit		Improved a lot		
	Worsened a bit		Worsened a lot		
	Not significant change		Don't know		
*What is your opinion on the overall quality of life (e.g. in terms of time, money and lifestyle) on the farm compared to the previous year?	Very bad	Slight decrease	Not good, not bad	Good	Much better

SELF-EVALUATION AND HOLISTIC ASSESSMENT OF CLIMATE RESILIENCE OF FARMERS AND PASTORALISTS (SHARP+)

*3. Agricultural production activities (core module)						
*Are any of the below-mentioned activities carried-out in your farm?			Yes/ No	*What is your main agriculture activity? <i>From previously selected</i>		
Crop production (e.g. food crops, vegetables, cash crops, fruit)?						
Livestock production (herding, penning, pastoralism, feed production, etc.)?						
Agroforestry (tree production, assisted natural regeneration, tree planting combined with crops)?						
Aquaculture (production of fingerlings, fish keeping)?						
Bee keeping?						
Fishing?						
Other agricultural activity (Specify)						
*Which best describes your level of production and/or commercialization?		I am a subsistence farmer; production is mostly for household and farm use	I produce at small-scale, but I manage to sell few products to local consumers	I sell mostly to local markets/customers, but some production is consumed by family and farm	I am a fully commercialized farmer (sell goods mostly to regional, national or international markets)	I am a contract farmer (with a company, supermarket or government)
*Are you able to meet your food and nutrition needs from your own production and sales (if any)?			Not at all	A little	Average	A lot Completely

*4. Land access (core module)			
*4.1 In the last 12 months, how much land did you have access to for your agricultural/pastoral activities? (total amount of ha) <i>decimal</i>		Number of hectares	
Select all the types of land your household has access to, in the last 12 months 4.1>0			
Type of land	How many hectares is the land?	Do you pay a fee to access it?	Who owns it?
Private agricultural land	List: < 0.5 ha; 0.6 – < 1 ha; 1 – < 3 ha; 3 – < 5 ha; 5+ ha; Don't know	---	List: only me; joint with spouse; joint with another household member; spouse, another household member; not owned by household.
Rented agricultural land	List	List: yes (money); yes (in-kind, e.g. part of the harvest); yes (both money and in-kind); no.	Which member of your household has the (formal or informal) right to use this land? List: only me; only my spouse; everybody in the household.
Communal agricultural land	List	List	List
Communal forest land	List	List	List
Pastureland	List	List	List
Other (specify)	List	List	List
*Do you feel secure with your land tenure? 4.1>0	Yes	More or less	No
*Did you convert any natural land (prairie, forest, or savannah) to	Yes	No, there is no natural land on the	No, the existing natural land on the farm was left as is (still present)



production land during the last five years? 4.1>0		farm (there has never been)			
*Is the land you have access to and your tenure situation good enough to provide for your household needs? 4.1>0	Not at all	A little	Average	A lot	Completely

*5. Crop production (core module)					
Seasonal crops (live maximum two years)					
*5.1 In the last 12 months did you plant any seasonal crops?	Yes		No		
*5.2 Who in the household is involved in the cultivation of crops? (if yes is selected in the first question) 5.1 = yes	Only/mostly men	Only/mostly women	Both men and women similarly		
*5.3 Which were the main ones? (in terms of income or food provision)? 5.1 = yes					
Name of main seasonal crops planted	Surface cultivated (ha)	Production in last season (kg)	*Number of varieties cultivated		
1.					
2.					
3.					
4.					
5.					
*5.4 Are any of your seasonal crops irrigated? 5.1 = yes	Yes		No		
5.5 If rice is selected: 5.1 = yes					
5.6 What type of rice production do you practice? 5.1 = yes and 5.5 = yes Single select	Upland dry rice		Irrigated continuously flooded	Irrigated intermittently flooded	
	Rainfed flood-prone	Rainfed drought-prone	Deepwater rice	Other (specify)	
Perennial crops (live longer than two years) – for food production					
*5.7 In the last 12 months, did you have any perennial crops growing in your fields?	Yes		No		
*5.8 Which were the main ones? (in terms of income or food provision) 5.7 = yes					
Main perennial crops planted	Cultivated surface (ha)	Production (kg)	*Number of varieties cultivated		
1.					
2.					
3.					
4.					
5.					
*5.9 Are any of your perennial plants irrigated? 5.7 = yes			Yes	No	
*In the last 3 years, how have your yields changed?			Increased	Decreased	Remained the same
*During the last 3 years, was your household able to afford enough seed for each growing season?	Not necessary because household saved seed		No		Rarely
	Sometimes	Often	Always		Other (Specify)
*What are the main sources of your crop seeds or plants? (both seasonal and perennial) 5.1 = yes or 5.7 = yes	Own production	Shop/Market	Family /Friend/ Neighbour	Government	NGO
	Cooperative	Plant nursery	Community seed bank	Another source (specify)	

SELF-EVALUATION AND HOLISTIC ASSESSMENT OF CLIMATE RESILIENCE OF FARMERS AND PASTORALISTS (SHARP+)

<p>*What is the origin of your main crops? <i>Select one</i> 5.1 = yes or 5.7 = yes</p>	Only local / native varieties	Only new / non-native species, including improved seeds (e.g. heat resistant, high yield)		A mix of both - about half of native and half of new species	
	Mostly local/native varieties, with a small share of new varieties		Mostly new/non-native species, with a small share of local varieties		
<p>*Are your crops adapted to current local climate and agronomic conditions? 5.1 = yes or 5.7 = yes</p>	Yes, most of them	Yes, but only some		No, almost none	
<p>*How much of your crop production do you estimate was lost before harvesting? 5.1 = yes or 5.7 = yes</p>	Nothing or very few (less than 10%)	Some of it (10-30%)	About half of my production	Most of my production (more than 60%)	
<p>*How much of your crop production do you estimate was lost after harvesting during the last season? 5.1 = yes or 5.7 = yes</p>	Nothing or very few (less than 10%)	Some of it	About half of my production	Most of it (more than 60%)	
<p>Which actions did you take to process, add value, maintain high quality and/or reduce loss in your crops and products? 5.1 = yes or 5.7 = yes <i>Multiselect</i></p>	No action taken (e.g. immediate consumption, gift to friends)	Improved cleaning of the product	Sorting	Packaging	
	Quick cooling	Basic storing of seeds / products (without refrigeration)	Drying (e.g. under the sun or in an oven)	Good refrigerated storage	
	Good transportation & distribution (to markets or dealers)	Transformation of the product/ processing		Other (specify)	
<p>How do you manage crop residues, processing residues, and organic matter? 5.1 = yes or 5.7 = yes <i>Single select</i></p>	Reused (e.g. through compost, as a soil cover, animal feed, biofuel or other uses)	Left in piles or taken off farm		Burned or discharged into waterways	
<p>*Are the number and different types of crops you cultivate sufficient for the needs of your household? 5.1 = yes or 5.7 = yes</p>	Not at all	A little	Average	A lot	Completely

6. Weed species and management (optional module)

*6.1 In the last 12 months, have you seen any weeds on your fields?	Yes	No
6.2 Approximately, what percentage of your fields is covered by weeds? 6.1 = yes		
In the last 12 months, how many types of weed species have you observed in your fields? 6.1 = yes		
*6.3 What practices have you used to manage them? 6.1 = yes	I did not take any action	Cover crops
	Hand weeding	Hoe weeding



Multiselect, 'didn't take any action' cannot be selected with another option	Herbicides		Associating my main crop with other crops		
	Livestock grazing		Other practices (specify)		
*6.4 To what extent were the management methods you used effective in limiting the negative impacts of weeds on your farmland? 6.1 = yes and 6.3 not equal to "I did not take any action"	Not at all	A little	Average	A lot	Completely

*7. Pest management practices (core module)					
*7.1 In the last 12 months, were your crops significantly affected by any pest or disease?	Yes			No	
7.2 Which pest/disease affected you the most? 7.1 = yes					
*7.3 In the last 12 months, did you use any pest/disease management practice for the affected crops? 7.1 = yes	Yes			No	
7.4 If not, why? 7.3 = no	I do not know how to build traps or which methods to use (specific species, insects)		I cannot afford pesticides		
	It is very time consuming and exhausting		I cannot access pest-resistant seeds		
	I did not know there were pests or diseases until it was too late		Other (specify)		
*7.5 What practices have you used? 7.3 = yes Multiselect	Conduct regular visual examinations of plants to detect pests or disease and systematic removal of plant parts attacked	Use traps, repellents (including repellent species), and natural pesticides	Create or preserve places (including plant species) for beneficial predators of pests to live		
	Maintain written record of pest infestation, treatments, and results	Use synthetic pesticides specific to the crop and/or pest at the proper dosage and timing	Apply synthetic pesticides preventatively (e.g. on a regular schedule regardless of whether a pest or disease threat currently exists)		
	Practice of crop rotation	Mixed cropping and / or intercropping	Adjustment of planting time		
	Application of crop spacing	Use one pesticide no more than two times or in mixture in a season to avoid pesticide resistance	Adopting pasture rotation to suppress livestock pest population		
Other (specify)					
If "synthetic pesticides" is selected:					
*7.6 Do any of the synthetic pesticides used on your farm have a red band around the container or on the label? 7.5 = one of two highlighted responses where "synthetic pesticides" are mentioned	Yes, they all have labels with instructions on dosage, safety, etc. that I understand	Yes, they have red labels but with no instructions	No		
*7.7 In the last season, how often did you use pesticide protective gear? 7.5 = one	Always	Sometimes	Never		

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<i>of two highlighted responses where "synthetic pesticides" are mentioned</i>					
*7.8 What did you do with the containers after using the products? 7.5 = one of two highlighted responses where "synthetic pesticides" are mentioned	Gave to collectors (such as recycling facilities)	Threw away in the trash	Re-used		
	Threw away on ground	Threw near a water stream	Other (specify)		
*7.9 To what extent did the practices you used prevent the pest/disease from affecting your household's food availability and revenues? 7.1 = yes	Not at all	A little	Average	A lot	Completely

*8. Livestock production practices (core module)				
*8.1 In the last 12 months, did you have any farm livestock?	Yes		No	
*8.2 What type of livestock system do you identify your holding with? 8.1= yes	Nomadic	Semi-nomadic	Seasonal or transhumant	
	Smallholder livestock farm	Large/industrial farm or multi-process industrial system	Extensive livestock production on communal pastures	
*8.3 Who in the household is involved in the raising, breeding and /or managing livestock? 8.1= yes	Only/mostly men		Only/mostly women	Both men and women similarly
*8.4 Please select the main species owned (income or food provision): 8.1= yes				
*Name of species owned		*Number of breeds (including crossbreeds)		
List: cattle, buffalo, horses and other equine animals, camels, sheep, goats, pigs, poultry, bees, silkworms, other (specify)		1; 2; 3+		
8.5 Does your farm consist mostly of ruminant production (e.g. cattle, goats, sheep)? 8.1= yes		Yes		No
8.6 What is the main type of manure management system used on the farm? 8.1= yes	Open-air lagoon or discharged into water bodies	Direct use (collected and spread on cropping area, left on pasture)	Compost or decomposition by bacteria without oxygen (biodigestion)	
*8.7 What is the origin of your main breeds? 8.1= yes	Only local/native breeds	Only new / non-native species, including improved breeds (e.g. heat resistant, high yield)	A mix of both - about half of native and half of new breeds	
	Mostly local/native breeds, with a small share of new breeds		Mostly new/non-native breeds, with a small share of local breeds	
*8.8 Are your breeds adapted to current local climate and agronomic conditions? 8.1= yes	Yes, all / most of them	Yes, but only few	No	



*8.9 Are the number and diversity of animals you own sufficient for the needs of your household? 8.1 = yes	Not at all	A little	Average	A lot	Completely
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9. Livestock breeding practices (optional module)

	*9.1 Main animal species owned	*9.2 What is the main source of your young stock?	*9.3 Have you tried to breed better animals on-farm?	9.4 What character of the animals did you try to improve? 9.3 = yes
1.		List: on-farm breeding, shop/market; family/friend/neighbour; government; NGO; dealer; cooperative; commercial animal farm; other (specify)	Yes/No	List: size/weight; longevity; ability to live on its own (no housing, good scavenger); fertility (number of calves or eggs produced); productivity (milk, wool); disease resistance; heat resistance; taste of meat/milk; nutritional content; colour or aesthetics of animal; other (specify)
2.				
3.				
4.				
5.				

*To which extent the way in which you breed your animals was good to meet your farming needs? At least one animal must be entered into question 8.4	Not at all	A little	Average	A lot	Completely
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10. Livestock nutrition and health (optional module)

Animal nutrition and housing

For the main animals you have (in terms of income or food provision) ...

10.1 Animal species	*10.2 What type of food do they eat?	*10.3 Do you keep them grazing on pasture or agricultural lands during part or throughout the year?	*10.4 Do you give food supplements to them? (Including concentrate feeds (grains) produced on own farm, purchased concentrated feeds and synthetic supplements)	*10.5 Are your animals housed at day and/or night?
Species 1	List: wet fodder; dry fodder; farm residues; by-products; other (specify)	Yes/no/not applicable	Yes/no	Yes/no
Species 2		Yes/no/not applicable	Yes/no	Yes/no
Species 3		Yes/no/not applicable	Yes/no	Yes/no
Species 4		Yes/no/not applicable	Yes/no	Yes/no
Species 5		Yes/no/not applicable	Yes/no	Yes/no

Animal health

*In the last 12 months, did you lose a significant proportion of your animals?	Yes	No
*If yes, what were the most important reasons for losses?	Disease	Predator (incl. theft)
	Accident (e.g. fire)	Unknown reason

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	Climate stress (e.g. extreme heat, floods)	Other (specify)			
*Which statement best describes the way livestock diseases are managed on the farm?	I give animals medication routinely to prevent them from becoming sick	I follow my veterinarian or a local expert's recommendation for the treatment of diagnosed diseases	I do not consult professionals or experts about animal diseases, but I use traditional knowledge		
	I do not provide my livestock with any veterinary care (I do not know what to do)	I vaccinate my livestock as needed	Other (specify)		
*To what extent did the food and housing provided to your animals allow them to remain healthy and contribute to your household food security and revenues?	Not at all	A little	Average	A lot	Completely
*To what extent did the disease management practices and veterinary services you use allow you to preserve the health of your livestock?	Not at all	A little	Average	A lot	Completely

11. Farm inputs (optional module)					
*Please indicate which of the following types of inputs you had access to in the last 12 months:					
Seeds	Livestock/inseminator		Fertilizers		
Mechanized farm equipment	Non-mechanized farm equipment		Pesticides		
Veterinary products	Manual labour	Financial services		Other (specify)	
*In the last 12 months, how easy was the access to these inputs?	Easy		A bit difficult		Difficult
*Do you usually have more than one supplier for the inputs mentioned?	Yes, many suppliers are available in the area		Yes, but only few suppliers are available		No, I mainly rely on a single supplier
*To what extent does your level of access to inputs allow your household to build its productive needs?	Not at all	A little	Average	A lot	Completely

*12. Water access and management (core module)			
*12.1 In the past 12 months, how many sources of water did you have access to (please specify sources for household consumption and for agricultural use)?	*12.2 Out of those sources of water, what is the main source of water you use?	12.3 Time needed to reach the main water source and collect water	12.4 In the last 3 years, has water availability from this source changed?
Household consumption	1, 2, 3+	List: tap water (chlorinated); tap water (not chlorinated); borehole; private well; communal well; protected ('box') spring; unprotected spring; rainwater harvesting container; water vender; dam; stream; river, pond/late; irrigation canal; bottled water; other (specify).	List: < 30 minutes; 31 minutes to 60 minutes; over 60 minutes; not applicable
Agricultural field irrigation	1, 2, 3+	List: borehole; cistern; dam, Pipeline, Reservoir, River/water stream/lake,	List
			List: yes, increased; yes, decreased; no, stayed the same; don't know



		Well, Rainfall, Tap water, Pond, Irrigation canal, Other(specify)					
Livestock	1, 2, 3+	List		List	List		
12.5 In the last 12 months, did you do anything to improve water conservation in your farm system and household? <i>Multiselect, didn't do anything cannot be selected with another option</i>	No, I did not do anything	Planting pits, and semi-circular bunds	Water retention ditches, stone bunds, vegetation strips, contour lines and trenches (furrows)	Water early morning or late at night (when the temperature is lower)	Water harvesting techniques (tanks/small damns)		
	Terracing	Mulching (laying a thin layer of vegetal cover on the ground)	Cover crops to reduce water run-off	Localized irrigation	Other (specify)		
*12.6 To what extent were the actions taken effective in increasing water availability for your needs (household/farm/animals)? 12.5 = any answer selected other than "didn't do anything"		Not at all	A little	Average	A lot	Completely	
*Does your household treat water before drinking it (any treatment method: boiling, allowing to settle, filter, chemical treatment, etc.)?		No, water is potable / household does not believe treatment is necessary	Never, household does not know / cannot afford	Rarely	Sometimes	Often	Always
*Can your household usually afford to pay the fees (direct payments and/or maintenance fees) for using water for agriculture (e.g. irrigation or livestock)?		No	Rarely	Sometimes	Often	Always	There is no need to pay
*Do members of your household and others who live on your farm have consistent access to sufficient and adequate water for human use (i.e., for water intake, hygiene, and cooking needs)?		Not at all	A little	Average	A lot	Completely	

13. Water quality (optional module)

*13.1 In the last 3 years, have you observed any of the following processes near your main water sources?		
Pollution from chemical products (pesticides, oil, industrial by-products, waste-water discharges)	Yes	No
Nutrient runoff of manure or fertilizers from agricultural fields near the water source (spring, well, pond, reservoir, streams)	Yes	No
Increased sediments and siltation (mud pollution) of water source	Yes	No
Algal blooms in water source (spring, well, pond, reservoir, river)	Yes	No
Dumping or leaking of organic waste in the water (e.g. manure, dead animals, toilets, faecal matters)	Yes	No
Intensive animal farming around shallow groundwater wells or streams	Yes	No

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Bad smells in the water source	Yes	No			
Other (specify)	Yes	No			
*What actions has your household taken to deal with these problems? 13.1 = any option other than no water problems observed					
Not done anything	Buy bottled water	Filter the water			
Used activated carbon	Set up an aeration system and re-pump	Chlorination			
Speak with government or NGO to address problem	Stop using the polluted water source	Reduce use of herbicides, fertilizers and chemicals within catchments			
Prevent roaming of domestic animals near the source water (e.g. fence)	Establish drinking-water protection zones with land use restrictions (e.g. no or limited activities such as agriculture, horticulture, wildlife, swimming, boating, industrial discharge)	Other (specify)			
*Is the water you have access to suitable for human consumption?	Not at all	A little	Average	A lot	Completely
*Is the water you have access to suitable for your agricultural activities, including animal consumption?	Not at all	A little	Average	A lot	Completely

14. Soil quality and land degradation (optional module)

Please list up to three main soil colours and associated soil textures that you have observed in your fields			
*Specify the main soil colours that you have observed	What is the associated soil texture type		
List: Dark brown, red-brown or orange, yellow, grey, other (specify); not able to determine soil colour	List: sandy (drains quickly, does not hold water or nutrients); clayey (holds nutrients and water, water does not flow easily); stony; loamy (holds nutrients and water); other(specify); not able to determine soil texture		
List	List		
List	List		
*Generally speaking, when water falls on the soil in your fields (e.g. during rain or irrigation), does it...			
Drain quickly?	Drain normally? (it is evenly absorbed by the soil)	Not get absorbed?	
Generally speaking, is the soil on your land soft and easy to till? (even if the farmer does not till)	Yes	No	
*Have you seen insects inside the soil in your fields? (e.g. earthworms, termites)	Yes, many	Yes, few	No
*Please list the main soil degradation processes you have observed in the last 3 years: <i>No soil degradation cannot be selected with any other option.</i>			
1	List: no soil degradation observed; erosion (from wind); erosion (from water); diversity decline in species composition (shift of flora and invasive species); increased pest and weed competition; degradation of the quality of grazing areas; soil salination/alkalinisation (preventing crops from growing); deforestation (reduction in trees and shrubs); compaction (hard ground); soil pollution (poisoned soil); gully erosion; landslides; riverbank erosion; coastal erosion; reduction of vegetation cover; acidification; sealing and crusting (soil forms a hard crust); waterlogging (water lies on the ground); loss of habitats; aridification (soil gets very dry); fertility decline and reduced organic matter content; other (specify)		
2	List		
3	List		



*Have you observed any trend in the main process(es) listed?	Increased		Remained the same		Decreased	
*Is the soil on your land suitable for your agricultural activities?	Not at all	A little	Average	A lot	Completely	

***15. Land management practices (core module)**

*15.1 In the last 12 months, did you take any actions to improve or preserve the quality of your soil?	Yes		No			
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*Which ones?

Liming (applying chalk, limestone, wood ashes and similar material to decrease soil acidity and improve soil activity)	Fallowing/shifting cultivation	Slash and burn			
Zero/minimum tillage	Rotational grazing	Crop rotation			
Wind break/hedge	Intercropping	Mulching			
Manuring/composting	Vegetative strips	Agroforestry (trees grow in the fields), afforestation, forest protection			
Gully control/rehabilitation	Terracing or boundary planting (including contour planting)	Creating a fire break			
Planting cover crops	Living fences	Planting nitrogen-fixing annual or perennial plants (e.g. legumes)			
Building earth or soil bunds	Crop residues	Animal urea			

Synthetic fertilizers	Other management practices (specify)
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*15.2 What percentage of your cultivated land is intercropped? 15.2= <i>intercropping</i>	List: 1 – 20%; 21– 40%; 41– 60%; 61– 80%; 81– 100%; unable to estimate
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*Did you produce the natural fertilizers/amendments in your farm? 15.2= <i>manuring/composting or urea or synthetic fertilizers</i>	Yes		No		
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*How do you determine how much fertilizer (synthetic or natural) to apply to your crop(s)? 15.2= <i>manuring/composting or urea or synthetic fertilizers Single select</i>	We apply fertilizer based on a careful assessment of our soil and crops, not exceeding the recommended doses (including farmer observation, professional tests or analyses, guidelines given by extension services or retail outlets)	We apply fertilizer based on general advice for the region or for our crop(s)	Based on how much we can afford without any assessment		
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Over the last year, did you use any of the following measures to mitigate the environmental risks associated with the use of fertilizers: 15.2= <i>manuring/composting or urea or synthetic fertilizers Multiselect</i> 'Did not use any' cannot be selected with any other options	Avoid application before and after (forecasted) rainfall event	Split fertilizer application according to crop uptake	Avoid application on steep slopes or in areas prone to flooding		
	Use enhanced efficiency fertilizers (urease inhibitor)	Use buffer strips along water courses	Did not use any		

*To what extent did the land management practices used help to preserve the quality of your farmland? 15.1= <i>yes</i>	Not at all	A little	Average	A lot	Completely	
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*16. Trees (core module)				
*16.1 Do you have any trees on your farmland?		Yes		No
*16.2 In the last 3 years, was there any change to the number of trees on your farm? 16.1 = yes	Decrease (removing focus crop trees, shade trees, natural forest trees, or other crop trees)	No change		Increase (include planting new trees from cuttings or from seed)
*16.3 How would you describe trees and their distribution on your land? Single select 16.1 = yes	Few and scattered	Many scattered evenly throughout the land		Bordering the land (e.g. windbreaks, shelterbelts and corridors of trees)
	A forested area (without any other predominant land use)	Commercial plantations		Mangroves Other (specify)
*16.4 Approximately, how many different types/species of trees grow on your land? 16.1 = yes	1; 2-5; 6-10, 11-15; 16-20; 21+			
16.5 What species of trees are on your farm, apart from the planted perennial trees previously mentioned? 16.1 = yes				
16.6 Are your main trees currently productive? (e.g. fruits, timber, leaves)	Yes, and it's increasing; Yes, but declining; Only some of them; Not yet, they are still growing; No			
*16.7 In the last 3 years, has the diversity (number of different types) of trees on your land: 16.1 = yes	Decreased?	Remained the same?		Increased?
16.8 Do you have access to forest outside your farmland with the possibility to use tree products (timber and non timber products)?		Yes		No
*16.9 In the last 3 years, has it been ... 16.8=yes	Degraded?	Remained the same?		Improved?
16.10 If degraded or improved: please explain why it has changed: 16.9 = degraded or improved Multiselect	Agriculture expansion/reduction	Expansion/reduction resulting from livestock		Climate change/natural disasters
	Rural-to-urban migration	Change in land tenures		Wars/conflicts
	Urban-to-rural migration	Small-scale timber extraction		Large-scale timber extraction
	Forest protection projects/legislation	Infrastructure development (e.g. Road, electricity)		Economic crisis
	Ecotourism development	New or revised forest legislation		Other (specify)
*16.11 Which of the following tree products do you use? (Timber and non-timber products) Multiselect, "I do not use any products" cannot be selected with any other option.	On-farm trees		Forest trees	
	List: I do not use any products from the trees; wood for charcoal; wood for firewood; wood for construction material; fibre; timber (commercial purposes); feed		List: I do not use any products from the trees; wood for charcoal; wood for firewood; wood for construction material; fibre; timber (commercial purposes);	



	products (animal consumption); food products (for people); soil fertilizers; natural remedies (for animals); natural remedies (for people); products for the protection of crops (e.g. Neem extract); shadow for crops; craftsmanship; dyes; cosmetics; honey; wild fruits; wild vegetables; other (specify)	feed products (animal consumption); food products (for people); soil fertilizers; natural remedies (for animals); natural remedies (for people); products for the protection of crops (e.g. Neem extract); shadow for crops; craftsmanship; dyes; cosmetics; honey; wild fruits; wild vegetables; other (specify)			
*16.11 To what extent do the trees and the tree products you have access to provide benefits (e.g. economic, productive, aesthetic) for your household and farm? 16.1 = yes or 16.8 = yes	Not at all	A little	Average	A lot	Completely

17. Landscape characteristics (optional module)					
*What kind of landscape surrounds your main field? <i>Multiselect</i>	Cultivated area (seasonal crops)	Pasturelands	Protected natural area (e.g. national parks, nature reserves)		
	Planted trees/hedges	Tree plantations (e.g. mango, oil palm)	Forest areas but not officially protected (presence of trees without any other predominant land use)		
	Mangroves	Wild unmanaged area	Water body		
	Degraded land	Protected wetland	Used wetland (e.g. for cropping, pasturing)		
	Grasslands	Transhumant corridor	Constructed area (buildings, housing, roads, etc.)	Other (specify)	
*In the last 12 months, have you regularly observed beneficial insects (bees, wasps, ladybugs, ants, etc.) in your fields?	Yes, many of them	Yes, some	Barely / No		
*To what extent do the different elements bordering your land positively affect your farm system?	Not at all	A little	Average	A lot	Completely

18. Energy sources (optional module)			
*What are the main energy sources you use for your household and agricultural activities (Please select up to three)?			
Purpose of energy use	*Source 1 (Most important one)	Source 2	Source 3
*Household (lighting, cooking, heating, charging electronic devices, etc.) <i>Multiselect</i>	List: electricity; solar; wind; biogas; firewood; charcoal; domestic waste; agricultural residues; manure; oil; paraffin; diesel; gas; wood residues; other (specify)	List	List
*Agriculture (machinery, lighting, etc.)	List	List	List
*[if select charcoal or fuel wood] What was the main source for the	Purchased	Collected from managed natural	Collected from forest (unlimited use)

wood or charcoal for energy during the last production year? <i>Single select</i>		forest with limited extraction			
	Collected from managed plantations or planted woodlots	Tree pruning		Not applicable	
How often do you use it?	Always	Very often	Rarely	Not applicable	
*Do your household and farm meet their energy needs based on the sources used?	Not at all	A little	Average	A lot	Completely

19. Energy conservation practices (optional module)

*19.1 Do you use any of the following practices to reduce your energy consumption or eliminate smoke (e.g. when cooking)? *Multiselect, 'No practice used' cannot be selected with any other option.*

No practice used	Recycling /re-using (e.g. of fuel wood to make charcoal)	Energy-saving stoves (for cooking)
Energy efficient appliances/equipment/devices	Energy-saving light bulbs	Replace diesel pumps with electric pumps for irrigation
High efficiency heating systems (e.g. biomass boilers for meat, pigs, horticulture)	Improved cooling systems	Improved drying facilities (e.g. for grains, vegetables, fruits, meat)
Optimisation of insulation (e.g. for dairy, horticulture)	Improved ventilation (e.g. for meat, poultry, eggs, horticulture)	Other (specify)

*To what extent are these methods effective in reducing your household's and farm's energy consumption and/or smoke? <i>19.1 != No practice used</i>	Not at all	A little	Average	A lot	Completely	Not applicable
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***20. Shocks (Core module)**

*20.1 In the last 3 years, has your household or farm system been affected by any unexpected climate shock (extreme event)?

			Yes	No
20.2 Type of extreme event <i>20.1 = yes</i>	# number of times it happened (last 3 years)	How damaging was this event for your household?	Impacts of this event <i>Select up to three, cannot select 'No major change' with any other option.</i>	Which coping strategies have you tried in the farm to cope with this event? <i>Select up to three, cannot select 'Did not do anything' with any other option.</i>

Drought	1,2,3,4,5+	Low-minor; Medium-moderate; High-major	Loss of productivity Crop failure Need for greater inputs Landslides Spread of pests Fire Land erosion Coastal erosion Declining water availability Reduced food security	Shift to crop production Shift to animal production Change the crop/animal varieties /breeds Test different land management practices Test different water management practices Off-farm employment Started an education programme (outside agriculture) Started an education programme (inside agriculture)
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			Crop damage Salinization Loss of animals Decrease in fodder for livestock Damage to infrastructure Loss of property Health risks (including death) Decrease in income Rising poverty levels No major change/impact Other (specify)	Started a business Seasonal migration Permanent migration Asked children help more than usual with household work Sent children to work outside the household Reduced healthcare spending Sold agricultural assets (e.g. livestock, farmland, seeds) Sold/left home Used savings or sold goods (e.g. TV, jewellery) Sold farmland Relied on aid organizations or government support Borrowed money from cooperative or village fund (community source) Did not do anything Other (specify)	
Extreme heat	1,2,3,4,5+	List	List	List	
Flood	1,2,3,4,5+	List	List	List	
Late onset of rain	1,2,3,4,5+	List	List	List	
Sudden temperature changes	1,2,3,4,5+	List	List	List	
Extreme cold	1,2,3,4,5+	List	List	List	
Frost	1,2,3,4,5+	List	List	List	
Fire	1,2,3,4,5+	List	List	List	
Strong winds	1,2,3,4,5+	List	List	List	
Typhoon/Hurricane	1,2,3,4,5+	List	List	List	
Storms	1,2,3,4,5+	List	List	List	
Increased sea level/tidal waves	1,2,3,4,5+	List	List	List	
*20.3 Have you and other household members changed behaviour in response to these changing patterns? (e.g. Change in agricultural practices) 20.1 = yes				Yes	No
*20.4 In the last 3 years, has your household or farm system been affected by other types of shocks?				Yes	No
20.5 Type of event 20.4 = yes	# number of times it happened (last 3 years)	How damaging was this event for your household?	Impacts of the event <i>up to three, cannot select 'No major change' with any other option.</i>	Which coping strategies have you tried in the farm to cope with this event? <i>Select up to three, cannot select 'Did not do anything' with any other option.</i>	
Conflict	1,2,3,4,5+	List	Loss of production Decrease in fodder for livestock	List	

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			Damage to infrastructure Loss of property and of productive assets (including house, land and livestock) Serious health risks (including death) Decrease in income Rising poverty levels No major change/impact Other (specify)				
Livestock raiding	1,2,3,4,5+	List	List	List			
Human disease	1,2,3,4,5+	List	List	List			
Animal disease	1,2,3,4,5+	List	List	List			
Pest and disease outbreak (e.g. fungal, bacterial etc.)	1,2,3,4,5+	List	List	List			
Tsunami/Earthquake	1,2,3,4,5+	List	List	List			
*20.6 If the worst of the negative events you just mentioned were to occur in the next 12 months, how long do you think it would take for your household to return to a satisfactory situation? 20.1 = yes or 20.4 = yes		I don't know	Less than a month	Between 1 and 3 months	Between 3 and 6 months	More than 6 months	We would move, our household would not be able to recover
*If the worst of the negative events you just mentioned were to occur in the next 12 months, who do you think would be most likely to assist your household? (select the three main ones) 20.1 = yes or 20.4 = yes		Nobody	Family/relatives	Friends	Insurance company	Financial institution	
		Local government	National government	Aid organizations	Don't know	Other (specify)	
*How effective do you think your household's responses (actions and/or non-actions) were in coping with the shocks? 20.1 = yes or 20.4 = yes		Not at all	A little	Average	A lot	Completely	

21. Access to information on weather and climate change adaptation practices (optional module)

Weather forecasts

*21.1 In the last 12 months, did you have access to information on future weather and natural events?	Yes	No
*21.2 What type of weather information did you have access to? 21.1=yes, Multiselect		
Drought, flood or extreme events forecast	Seasonal weather forecast (for long rains or short rains)	Other (Specify)
Start of the rains forecast	Pest and disease outbreaks and management	



*21.3 Where did you access that information? 21.1=yes, <i>Multiselect</i>	List: government extension workers; traditional forecasters/indigenous knowledge; NGOs; community meetings; farmer organizations; cooperatives; community-based organizations; religious groups; agri-service providers; seed companies; family members; neighbours; radio; television; newspapers/bulletins; schools/teachers; cell phone; internet; agricultural shows; farmer field days/demonstrations				
21.4 Overall, how helpful was this information? 21.1=yes	Very	Somewhat	Not very much		
Climate adaptation practices					
*21.5 In the last 12 months, did you have access to information on cropping/livestock adaptation practices?	Yes		No		
*21.6 What type of information did you have access to? 21.5=yes					
Information on crop production and management	Information on livestock production and management	Post-production handling	Other (Specify)		
*21.7 Where did you access that information? *(source) 21.5=yes, <i>Multiselect</i>	List: government extension workers; traditional forecasters/indigenous knowledge; NGOs; community meetings; farmer organizations; cooperatives; community-based organizations; religious groups; agri-service providers; seed companies; family members; neighbours; radio; television; newspapers/bulletins; schools/teachers; cell phone; internet; agricultural shows; farmer field days/demonstrations				
21.8 Overall, how helpful was this information? 21.5=yes	Very	Somewhat	Not very much		
Sustainable resource management practices					
*21.9 In the last 12 months, did you have access to information on sustainable resource management?	Yes		No		
*21.10 Overall, was the information accessed enough for your household to predict and cope with weather events and climate patterns? 21.1=yes or 21.5=yes or 21.9=yes	Not at all	A little	Average	A lot	Completely

22. Information and communication technologies (optional module)					
*22.1 Do you have access to any electronic device to access information?		Yes		No	
*22.2 Please select the electronic device that you use. 22.1=yes		*Do you own it?		*What do you use it for?	
A mobile phone	Yes	No	Yes	No	List: Communication with family/friends; access to weather information; access to agricultural practices; early warning system; information on market prices; job searching; other (specify)
Internet connection	Yes	No	Yes	No	List
Television	Yes	No	Yes	No	List
Radio	Yes	No	Yes	No	List
*22.3 To what extent did the devices and the information accessed through them effectively improve your household and agricultural activities and revenues? 22.1=yes	Not at all	A little	Average	A lot	Completely

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*23. Access to markets (core module)					
*23.1 In the last 12 months, were you able to sell the products from your farm system?	Yes, most of the products I wanted to sell		Yes, but only few products		No
*23.2 Did you sell your products... 23.1!=no, Single select	Alone?		Through an organised producer group (formally registered)?		Through an organised producer group (informal)?
*23.3 Where did you sell your products? 23.1!=no, Multiselect					
Local market (<10 km)	Regional market (>10 km)	Street	Kiosk shop	Exclusively to an intermediary/dealer	To neighbours
Cooperative/farmer organizations/other types of group selling	To traders who come to the village	Farmer fair	Restaurant	Other (specify)	
*23.4 Why not? (If respondent answered No to the first question) 23.1=no, Multiselect					
The closest market is too distant	Selling at the market is not convenient (e.g. not profitable)	Selling at the market is expensive (e.g. fees, transaction costs)	Climate related extreme weather made it difficult to access markets (e.g. floods destroyed roads)	Other (specify)	
I am not interested	I do not know where to sell	I do not have enough production to sell		I would not know how to set the prices	
*23.5 How do you set prices for the products you usually sell? Single select					
Price chosen based on available information	I take the market's prices	Through the cooperative /farmers' organization	The dealer establishes them	Other (specify)	
*23.6 Are these prices usually...	Low?	Fluctuating a lot?	Good enough to make a profit?		
*23.7 Are you involved in any certification scheme to for example increase the price at which you sell your products? Single select	Yes, organic	Yes, fair trade	Yes, origin indication		
	Yes, other (specify)	No, but I am currently undergoing a certification process (specify which one)	No		
23.8 If not, why? 23.7=no, Single select	They do not exist in my area	I don't know what they are	Too expensive to be certified		
	Too complex to fulfil standards	I had a certification, but it was rescinded/taken away	I don't think it works		
	I am not aware of any		Other (specify)		
*23.9 To what extent do the conditions in which you sell your agricultural products help you provide enough income to meet	Not at all	A little	Average	A lot	Completely



the needs of your household and agricultural activities? 23.1!=no					
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*24. Income sources, expenditures and savings (core module)					
*24.1 In the last 12 months, how many different income sources did you have in the household?	1		2		3+
24.2 Were any of them from a non-farm activity? (e.g. paid labour, cash transfers, charcoal selling, remittances)	Yes			No	
24.2 If yes, which one(s)? 24.2=yes, <i>Multiselect</i>	Employment/Labour (in another farm)	Employment/Labour (outside agriculture)	Firewood collection/selling	Selling agricultural products (including processed ones)	Selling handicrafts
	Charcoal production/selling	Selling other timber and non-timber forest products (e.g. honey, thatch, construction, medicinal products, etc.)	Government transfers (e.g. social protection cash transfers, retirement pension)	Receive remittances	Other (Specify)
*24.3 Who in the household is involved in these non-farm activities? (if yes is selected in the second question) 24.2=yes, <i>Single select</i>	Only/mostly men		Only/mostly women		Both men and women similarly
*24.4 Among agriculture and non-agriculture activities, what were your household's main income source(s)? <i>Please specify up to three</i>	Most important income source			2nd source	3rd source
	List: crop production; livestock production; aquaculture; beekeeping; fishing; employment/Labour (in another farm); employment/labour (outside agriculture); market selling of agriculture products; firewood collection/selling; charcoal production/selling; receiving remittances; government transfers; retirement pension; selling handicrafts; other (specify)			List	List
*24.5 In the last 3 years, would you say your agricultural activities have been profitable?	Yes, always/ most times		Yes, but not always		No
*24.6 What were your household's largest expenditures and/or investments? Please specify up to three	Most important expenditure source			2nd most important	3rd most important
	List: breeding animals; livestock; seeds; farm equipment; irrigation infrastructure; food and beverages; health care; education; fees/commissions to sell in the market; trading partners' commission; transport;			List	List

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	fertilizers; pesticides; funeral; festivities (e.g. religious, marriage); other (specify)				
*24.7 Can your household afford your children's school fees and school supplies? <i>Single select</i>	No	Rarely	Sometimes		
	Usually	Always	There is no need to pay the fees, but can't afford the supplies		
	There is no need to pay the fees, and can afford the supplies		There is no need to pay the fees or supplies		
*24.8 After these expenditures, were you able to save some money?	Yes		No		
*24.9 How do you save your money? 24.8=yes, <i>Multiselect</i>	Cash (e.g. at home)	Saving structure/group	Bank		
	Microfinance institution		Other (specify)		
*Is the income generated by farm and non-farm activities enough to cover your food and other basic expenses?	Not at all	A little	Average	A lot	Completely

25. Major productive assets (optional module)

*25.1 Please specify up to five of the major productive assets that your household owns starting with the most important to least important:					
Ranking (1=most important, 5=least important)	Asset owned:				
1.	List: land, livestock/animals, seeds, farm equipment, financial (savings), other (specify), fishpond, means of transportation (e.g. car, truck), I do not own any				
2.					
3.					
4.					
5.					
*25.2 To which extent do the type and number of assets you own allow your household needs to be met? 25.1!='I do not own any'	Not at all	A little	Average	A lot	Completely

26. Access to financial services (optional module)

*26.1 In the last 3 years, has your household ever needed external financial support when faced with unexpected expenditures?	Yes	No			
*26.2 Have you been able to receive the support? 26.1=yes	Yes	No			
*26.3 What was (were) the main source(s) of support? 26.2=yes, <i>Multiselect</i>					
Family/friends	Group-based microfinance or lending	Government	Cooperative/Farmers' Organization	Bank	
NGO	Credit Union	Traders or Shopkeepers	Dealer/supplier	Insurance	
Private money lender	Joint development project & bank fund	Religious group	Other (specify)		
*26.4 Why were you not able to receive the support? 26.2=no, <i>Multiselect</i>					
Credit history was not good enough	Lenders not located nearby	No access to lending groups	Had an outstanding loan		



Inadequate collateral	Interest rates are too high	No reason given	Other (specify)			
*26.5 Was the amount sufficient to face the unexpected expenditures? 26.2=yes		Not at all	A little	Average	A lot	Completely

27. Insurance (optional module)							
*27.1 Are your goods (e.g. crops, livestock, land) insured (financially protected) against loss or damage?					Yes	No	
27.2 Who is providing the insurance? 27.1=yes							
Insurance company		NGO		Cooperative /farmers' organization			
Financial institution		Government		Other (Specify)			
27.3 Why did you not purchase insurance? 27.2=no							
No need for and insurance/ I have enough money/assets		Not aware of any		No funds to buy one	Insurance is not available		
Cultural belief/superstition		Don't understand how insurances work/the need of one		Previous bad experience	Other (specify)		
*27.4 Is your current insurance situation satisfactory for your farm system and household needs? 27.1=yes			Not at all	A little	Average	A lot	Completely

*28. Community cooperation (core module)				
*28.1 In the last 3 years, was there any problem that affected your community and required collective action?		Yes		No
28.2 What have been the main sources of conflict or tensions in your community? Select all that apply (if yes is selected above) 28.1=yes, <i>Multiselect</i>	Land use, e.g. for crop and livestock production	Land ownership between farmers and pastoralists		Displacement
	Decreasing agricultural yields and livestock productivity increase	Natural hazards (such as flash floods and dry spells)		Domestic violence
	Burglary (Theft, building)	Banditry (organized crime)		Robbery (armed)
	Violent disputes	Alcohol abuse		Drug abuse
	Child abuse	Other (specify)		
*28.3 Did you join other community members to address the problem? 28.1=yes		Yes		No
*28.4 In your community, do you have customary mechanisms in place to deal with problems within and/or across communities?		Yes		No
*28.5 Which ones? 28.4=yes, <i>Multiselect</i>				
Land committees	Water resource management committees	Elder's committees/councils	Dispute resolution committee	Other (Specify)
*28.6 Do you usually trust members of your community to help you in times of need?				
Yes, always	Yes, most of the times	Yes, sometimes	No	
*28.7 Do you feel that some households in your village/area have different economic or political opportunities than others linked to their religion or ethnic/minority group?				
No	Yes, a few households		Yes, less than half the households	
Yes, about half the households	Yes, more than half the households		Don't know	

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*28.8 Is trust and cooperation in your community enough to allow community members to discuss and solve common problems together?	Not at all	A little	Average	A lot	Completely
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*29. Group membership (core module)						
*29.1 Are you, or any other member of your household, a member of any group, organization or association?		Yes		No		
*29.2 Were any of these groups initiated by your community? 29.1 = yes		Yes		No		
*29.3 Please list the types of groups you (or household member) actively participate to 29.1 = yes						
	Group <i>Select a group</i>	Why do you (or household member) belong to this group? <i>For each group select as many reasons for belonging</i>				
1.	List: (agro-pastoralist/farmer) field school; agricultural producer's group (including marketing groups); livestock producer's group (including marketing groups); fisheries producer's group (including marketing groups); water users' group; watershed management group; forest users' group; tree nursery group; credit; microfinance; or merry-go-round group; funeral/burial/insurance group; marketing and income generating (non-agriculture); civic groups (improving community) or charitable group (helping others); local government; religious group; other women's group (only if not already listed); other men's group (only if not already listed); other youth group (only if not already listed); other (please specify)	List: input provision; improve access to facilities; improve link to markets; peer support; sharing experiences; meet other farmers; meet experts (e.g. researchers); learning/training; testing new practices; access to information (markets, weather); advocacy; i'm part of a programme/project; other (specify)				
2.	List	List				
3.	List	List				
*29.4 Are you (or the household member) the leader of any of these groups? 29.1 = yes, must have listed at least one group in		Yes		No		
*29.5 Does your community organize any festival linked to key moments of the season (e.g. coinciding with harvest, planting, flowering)?		Yes, and it is a meaningful event for the community		Yes, although it is not as important as it used to be		
		No, they have disappeared	No, we never had them	I don't know		
*29.6 To what extent does participation of members of the household in these groups and festivals provide useful knowledge or means to improve your household's livelihood?		Not at all	A little	Average	A lot	Completely

*30. Nutrition (core module)		
*Did anyone in the household eat the type of food in question over the last day and night?		
Any bread, rice noodles, biscuits, or any other foods made from millet, sorghum, maize, rice, wheat, millet, or any other locally available grain?	Yes	No
Any potatoes, sweet potatoes, yams, manioc, cassava or any other foods made from roots or tubers?	Yes	No
Any vegetables?	Yes	No
Any fruits?	Yes	No
Any beef, pork, lamb, goat, rabbit wild game, chicken, duck, or other birds, liver, kidney, heart, or other organ meats?	Yes	No
Any eggs?	Yes	No



Any fresh or dried fish or shellfish?		Yes	No		
Any foods made from beans, peas, lentils, or nuts?		Yes	No		
Any cheese, yogurt, milk or other milk products?		Yes	No		
Any foods made with oil, fat (animal or vegetable origin), or butter?		Yes	No		
Any sugar, honey or syrup?		Yes	No		
Any other foods, such as condiments, coffee, tea?		Yes	No		
*Where do you usually source your food from? <i>Multiselect</i>	Own production	Hunting/fishing	Gathering	Borrowed	Purchase
	Exchange labour for food	Gift (food) from family relatives	Food aid (NGOs, government etc.)		Other (specify)
*In the last 12 months, have you been able to stock food to be used later in the year (e.g. cereals, tubers)?	Yes, throughout the year	Yes, only during/after the harvest time	Not at all		Other (specify)
*Do you have access to a cereal bank in your community?		Yes		No	
*Do you have any granary/storage facilities at home?		Yes		No	
*Do all members of the household have access, every day, to adequate nutrition in a culturally appropriate and satisfying way?	Not at all	A little	Average	A lot	Completely

*31. Decision-making (Household) (core module)

*In the last 12 months, when decisions were made regarding the following aspects of your household life, who normally had the final say in the decision (when applicable)?			
Decisions	*What portion of these decisions are made by men? List: All or most; About half; Few or none; Not Applicable	*To what extent did you feel you could participate in the decisions? List: Not at all, Small extent, Medium extent, To a high extent, prefer not to say	*What portion of this activity is shared between men and women? List: All or most; About half; Few or none, Not Applicable
1. Household budgeting (e.g. planning the expenses, how much money to allocate)			
2. Household food purchases (e.g. what to buy)			
3. Minor household non-food expenditures (e.g. daily staples, clothing, school supplies)			
5. Domestic work/labour (i.e. caregiving, cooking, feeding, cleaning, paid domestic labour force)			
6. Major farm investments (land, machinery, infrastructure, irrigation)?			
9. Whether to engage or not in employment outside the farm/household (e.g. opening a shop, tailoring, basket			

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making, rope making, brick making, paid casual labour on other farms)?						
10. How to spend your own money (Income earned from market sales or wage employment)						
*Do you feel that the responsibilities and time spent by men and women in household activities are shared equally?	Not at all	A little	Average	A lot	Completely	Not Applicable

32. Decision-making (Farm management) (optional module)					
*In the last 12 months, when decisions were made regarding the following aspects of your household life, who normally had the final say in the decision carried out the activity (when applicable)?					
Crop production					
Agricultural decision	*What portion of these decisions are made by men? List: All or most; About half; Few or none; Not Applicable	*To what extent did you feel you could participate in the decisions? List: Not at all, Small extent, Medium extent, To a high extent	*What portion of this activity is shared between men and women? List: All or most; About half; Few or none		
1. What crops to plant?					
2. Inputs to be used (which crop varieties, types of fertilizers)					
3. Management of weeds and pests (when, hiring of labour, use of herbicides, management of weeds)					
4. Post-harvesting or processing use (sale, consumption, gift, transformation of the good, etc.)					
Animal production					
1. Types of animals (breeding, what animals to buy or raise)					
2. Feeding (what to feed animals, when, and who feeds them)					
3. Veterinary treatment (when to go for treatment, whether or not to seek treatment)					
4. What products to generate (milk, meat, leather, wool, eggs, honey) and purpose (sale, consumption, gift, etc.)					
*Do you feel that the responsibilities and time spent by men and women in farm activities are shared equally?	Not at all	A little	Average	A lot	Completely

33. Government policies and programmes on climate change, sustainable agriculture and forest management (optional module)	
*33.1 Are you aware of any governmental policies or programmes on climate change and sustainable agriculture that affect your household?	Yes No
*33.2 In the last 3 years, have you or other household members participated in any government programme or	Yes No



project related to climate change and/or sustainable agriculture? 33.1 = yes					
33.3 If yes: Who participated in these policies or programmes? 33.2 =yes		All household members similarly	Only men Only women		
*33.4 If yes, please indicate what services and benefits you received from participation to the programme/project 33.2 =yes, <i>Multiselect</i>	Education / training		Cash transfers		
	In-kind support		We provided information (e.g. for. surveys, censuses)		
	Legal advice (e.g. resource management)		Other (specify)		
33.5 Has there been any forest management initiatives at community level? (e.g. afforestation of reforestation projects)	Yes		No		
33.6 In the last 3 years, have you participated in any other project or programme?	Yes		No		
33.7 Who implemented it? 33.6 = yes, <i>single select</i>	University		NGO		
	Private sector		International organization		
	Other (specify)				
*33.8 To which extent did participation in government projects/programmes improve your household and farming activities conditions? 33.2 = yes	Not at all	A little	Average	A lot	Completely

*34. Farmers' priorities (self-assessed importance) (core module)	
*Based on all the topics we have discussed today, what would be the most important changes needed to improve your households' ability to cope with unexpected stresses and strengthen your livelihoods? <i>You can provide up to five.</i> Most important change needed to improve your households' ability to cope with unexpected stresses and strengthen your livelihoods	QUESTION FOR ENUMERATOR: Assign each area mentioned by the farmer to one of the aspects assessed in the SHARP+ survey (it can be completed later)
1.	List: Survey modules + Other (Specify)
2.	
3.	
4.	
5.	

*Module 35: Enumerator evaluation (core module)	
Do you consider that the responses given by the farmer accurately reflect the reality in the field?	Yes, absolutely. All responses are highly accurate ; Yes, most of the responses are accurate; More or less; Almost none of the responses seem accurate; Not at all (specify why not)

Annex C

Scoring system



Modular version

Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
2. Household characteristics	How many in the household are unable to work due to health/age reasons?	(# People unable to work /# Total number of people in household) *100	0%= 10, 1-10%= 7, 11-20%= 5, 21-30%= 3, 30%+= 0	12.1	AG_hh_ac_b
	Literacy (household head): What is the highest educational level of the household head?	Educational level of household head	None=0 Elementary /primary school=3 Secondary school=5 High school/Vocational training/Other informal training/education=8 Tertiary education (e.g. university)=10	12.4	AG_hh_ac_d
	Literacy (female – children): Do girls go to school? Do boys go to school?	Yes/No	Ratio: Girls: Yes, all of them= 10; Yes, only some=5; No= 0 Boys : Yes, all of them= 10; Yes, only some=5; No= 0 Score of girls/ Score of boys If ratio >=1, score is 10 If ratio <1, score is 0	12.3, 12.4	AG_hh_ac_c
	Literacy (female - adult): <ul style="list-style-type: none"> Have female adult household members completed any education programme or training? (e.g., agricultural training, vocational training) Have male adult household members completed any education programme 	Yes/No	Ratio: Women: Yes= 10, No= 0 Men: Yes= 10, No= 0 Score of women/ Score of men If ratio >=1, score is 10 If ratio <1, score is 0	12.3, 12.4	AG_hh_ac_a

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Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
	or training? (e.g., agricultural training, vocational training)				
	Are women youth (aged between 15 and 24) in the household in employment, education or training?	Yes/No	Yes= 10, no= 0	12.4	AG_hh_ac_e
	Are men youth (aged between 15 and 24) in the household in employment, education or training?	Yes/No	Yes= 10, no= 0	12.4	AG_hh_ac_f
	In the last 2 years, has any women migrated to find work elsewhere?	Yes/No	Yes= 10, no= 0	12.9	AG_hh_ac_i
	In the last 2 years, has any men migrated to find work elsewhere?	Yes/No	Yes= 10, no= 0	12.9	AG_hh_ac_j
	Do elders (or experienced people living in your household) contribute to the education of children? (e.g. Traditional cultivation techniques, prediction of weather events, reading/writing)	Yes/No	Yes= 10, no= 0	11.1	AG_hh_ac_g
	In the last 2 years, how has the overall health of the majority of the people in your village/area changed?	Options from list	Improved a lot= 10 Improved a bit=7 Not significant change=5 Worsened a bit=3 Worsened a lot=0 Don't know= 5	12.8	AG_hh_ac_h
3. Agricultural production activities	Are any of the below-mentioned activities carried out in your farm?	# of different activities carried out	1= 0, 2= 5, 3= 7, 4+= 10	4.2	AG_agr_ac_a
	Which best describes your level of production and/or commercialization?	# and type of options selected	I am a subsistence farmer, production is mostly for household and farm use= 2 I produce at small-scale, but I manage to sell few products to local consumers= 7 I sell mostly to local markets/customers, but some	10.5	AG_agr_ac_b



Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
			<p>production is consumed by family and farm= 10</p> <p>I am a fully commercialized farmer (sell goods mostly to regional, national or international markets)= 0</p> <p>I am a contract farmer (with a company, supermarket or government)= 5</p>		
4. Land access	In the last 12 months, how much land did you have access to for your agricultural/pastoral activities? (total amount of ha)	Total of ha inserted across all types of land	<p>Less than or equal to 0.3= 0;</p> <p>0.4- 1 ha=3; 1.1- 5 ha=6; more than 5.1ha =10</p> <p>Sum scores for each type of land selected, maximum of 10.</p>	5.4	EN_landac_ac_a
	In the last 12 months, what type of land did you use for your agricultural activities?	Whether the following options are selected: Communal agricultural land; Communal forest land; Pastures land	<p>If any of the options selected from the list=10</p> <p>Other options=0</p> <p>Average among the options selected</p>	1.4	EN_landac_ac_b
	In the last 12 months, what type of land did you use for your agricultural activities?	Whether private land is selected	<p>Private land=10</p> <p>Other options=0</p>	13.10	EN_landac_ac_c
	Do you feel secure with your land tenure?	Yes/More or less/No	<p>Yes=10</p> <p>More or less =5</p> <p>No= 0</p>	13.10	EN_landac_ac_d
	Did you convert any natural land (prairie, forest, or savannah) to production land during the last five years?	Yes/No	<p>Yes=0</p> <p>No, there is no natural land on the farm (there has never been)=5</p>	8.9	EN_landac_ac_e

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Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
			No, the existing natural land on the farm was left as is (still present)=10		
5. Crop production	In the last 12 months, which main seasonal crop species (in terms of income or food provision) did you plant? + In the last 12 months, which main perennial crops (in terms of income or food provision) did you have in your fields?	Number of species listed across both seasonal crops and perennials	1=0 2=1 3=3 4=5 5=6 6=8 7+=10	4.1; 6.6	AG_crop_ac_b
	*In the last 12 months, did you have any perennial crops growing in your fields?	Presence of perennials	Yes= 10, no= 0	2.1; 6.5	AG_crop_ac_a
	Number of varieties cultivated across species	Crop diversity: total number of varieties (seasonal and perennial, maximum 10) /total number of crop species (seasonal and perennial)	If total number of varieties/ total number of species is 1, score=0 If total number of varieties/ total number of species is 1.1-1.5, score=5 If total number of varieties/ total number of species is >1.5, score=10	5.1	AG_crop_ac_c
	What are the main sources of your crop seeds or plants? (both seasonal and perennial)	Number of sources selected	1= 0, 2= 5, 3+= 10	3.1, 5.5	AG_crop_ac_d
	Which actions did you take to process, add value and maintain high quality in your crops and products?	List of options selected	No action taken/Gift to friends=0 Storing seeds/Storing products seeds/products=3 Improved cleaning of the product=4 Sorting/packaging/quick cooling/Drying=6	13.7	AG_crop_ac_e



Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
			Good refrigerated storage/good transportation and distribution/transforming the product/processing =10 Sum scores across selected options. Maximum score=10.		
	During the last 3 years, was your household able to afford enough seed for each growing season?	List of options selected	No /Rarely= 0 Sometimes=3 Often=7 Always=10 Not necessary because household saved seeds=10 Other=7	13.8	AG_crop_ac_f
	What is the origin of your main crops? (Use of local seed varieties)	Origin of seed varieties and share	Only local/native varieties=5 Only new/non-native species, including improved seeds (e.g., heat resistant, high yield) =0 A mix of both - about half of native and half of new species=10 Mostly local/native varieties, with a small share of new varieties=7 Mostly new/non-native species, with a small share of local varieties=3	2.3; 11.6	AG_crop_ac_g
	Use of adapted crop varieties to local conditions	Yes/No	Yes, most of them=10 Yes, but only some=5 No, almost none=0	7.6	AG_crop_ac_h
	What type of rice production do you practice? (if applicable)	System types	Upland dry rice= 10	8.10	AG_crop_ac_i

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Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
			Irrigated continuously flooded=0 Irrigated intermittently flooded=5 Rainfed flood-prone=5 Rainfed drought-prone=10 Deepwater rice=10 Other (specify)=5		
	In the last 3 years, how have your yields changed?	Trend in yields	Increased=10 Remained the same=5 Decreased=0	13.9	AG_crop_ac_j
	How do you manage crop residues, processing residues, and organic matter?	Manure management options	Reused (e.g., through compost, as a soil cover, animal feed, biofuel or other uses)=10 Left in piles or taken off farm=5 Burned or discharged into waterways=0	2.2	AG_crop_ac_k
6. Weed species and management	In the last 12 months, have you seen any weeds on your fields?	Yes/No	Yes= 10, no= 0	7.1	EN_weed_ac_a
	What practices have you used to manage them?	# of practices used among the following: Cover crops; Hand weeding; Hoe weeding; Associating my main crop with other crops; Livestock grazing	I did not take any action=0, 1=5; 2=7 3+=10	7.1	EN_weed_b
7. Pest management practices	In the last 12 months, were your crops significantly affected by any pest or disease?	Yes/No	Yes= 10, no= 0	7.4	AG_spm_ac_a
	In the last 12 months, did you use any pest/disease management practices for the affected crops?	Yes/No	Yes= 10, no= 0	7.4	AG_spm_ac_b



Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
	What practices have you used? (general)	Number of different practices used	No=0 1 options= 0 2 options=4 3 options=7 4+ options=10	4.5	AG_spm_ac_c
	What practices have you used? (synthetic pesticide use)	Practices selected	"I apply synthetic pesticides preventively..."=0 "I use synthetic pesticide specific to the crop..."=5 "Use one pesticide no more than two times or in mixture in a season to avoid pesticide resistance ..."=5 All other options=10 Average across selected options	8.4	AG_spm_ac_d
	What practices have you used? (agro-ecological pest management practices used)	Practices selected	"Traps, repellent and natural pesticides" and/or "Create and preserve places..." and/or "Practice of crop rotation" and/or "Mixed cropping and/or intercropping" and/or "Adjustment of planting time" and/or "Application of crop spacing" and/or "Adopting pasture rotation to suppress livestock pest population" =10 All other options=0 Average across selected options	11.5	AG_spm_ac_e

SELF-EVALUATION AND HOLISTIC ASSESSMENT OF CLIMATE RESILIENCE OF FARMERS AND PASTORALISTS (SHARP+)

Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
	Do any of the synthetic pesticides used on your farm have a red band around the container or on the label?	Options	Yes, they all have labels with instructions on dosage, safety, etc. that I understand=8 Yes, they all have red labels but with no instructions=0 No=10	12.8	AG_spm_ac_i
	In the last season, how often did you use pesticide protective gear when using synthetic pesticides?	Frequency options	Never= 0 Sometimes= 5 Always= 10	12.1	AG_spm_ac_h
	What did you do with the containers after you have used the products?	Options from list	Gave to collectors (such as recycling facilities)=10 Threw away in the trash =6 Re-used/Threw near a water stream/Threw away on ground/ other =0	2.5; 8.4	AG_spm_ac_g
8. Livestock production practices	In the last 12 months, did you have any farm livestock?	Yes/No	Yes= 10, no= 0	4.1; 6.7	AG_animal_ac_c
	What type of livestock system do you identify your holding with?	List of options	Large industrial or Extensive livestock productions are selected=0 Other options=10	8.6	AG_animal_ac_d
	Number of species owned	Number of species ranked (maximum 5)	Number of species: 1=0 2=4 3=7 4+=10	4.1	AG_animal_ac_a
	Breeds diversity (including cross-breeds)	Breed diversity: total number of breeds owned for selected animal /total number of animal species owned	If total number of breeds/ total number of species is 1, score=0 If total number of breeds/ total number of species is 1.1-1.5, score=5	5.1	AG_animal_ac_b



Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
			If total number of breeds/ total number of species is >1.5, score=10		
	Use of local breeds	Origin of breeds and share	Only local/native breeds =5 Only new/non-native breeds, including improved breeds (e.g., heat resistant, high yield) =0 A mix of both - about half of native and half of new breeds =10 Mostly local/native breeds, with a small share of new breeds =7 Mostly new/non-native breeds, with a small share of local breeds=3	2.3; 11.6	AG_animal_ac_e
	Use of adapted breeds to local conditions	Yes/No	Yes, most of them=10 Yes, but only some=5 No, almost none=0	7.6	AG_animal_ac_f
	Does your farm consist mostly of ruminant production (e.g. cattle, goats, sheep)?	Yes/No	Yes=0, no=10	2.4, 8.6	AG_animal_ac_g
	What is the main type of manure management system used on the farm?	Manure management system	Open-air lagoon or discharged into water bodies=0 Direct use (collected and spread on cropping area, left on pasture)=5 Compost or decomposition by bacteria without oxygen (biodigestion)=10	2.4, 8.6	AG_animal_ac_h
	What is the main source of your young stock?	Number of different sources selected across species	1 type of source only= 0 2 types of sources=5	5.5	AG_breed_ac_a

SELF-EVALUATION AND HOLISTIC ASSESSMENT OF CLIMATE RESILIENCE OF FARMERS AND PASTORALISTS (SHARP+)

Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
9. Livestock breeding practices			3+ types= 10 Types across all the animal species owned		
	Have you tried to breed better animals on farm?	Yes/ No	Yes= 10, no= 0 Average across the species	10.2	AG_breed_ac_b
10. Livestock nutrition and health	In the last 12 months, did you lose a significant proportion of your animals?	Yes/No	Yes= 10, no= 0	7.5	AG_health_ac_a
	Which statement best describes the way livestock diseases are managed on the farm?	Disease management (options from list)	I give animals medication routinely to prevent them from becoming sick or I do not provide my livestock with any veterinary care (I do not know what to do)= 0 I follow my veterinarian or a local expert's recommendation for the treatment of diagnosed diseases and/or I vaccinate my livestock as needed =10 I do not consult professionals or experts about animal diseases (e.g. I use traditional knowledge)= 7	4.5	AG_health_ac_b
	Which statement best describes the way livestock diseases are managed on the farm?	Disease management (options from list – access to veterinary services or expert advice)	I vaccinate my livestock as needed or I follow my veterinarian or a local expert's recommendation for the treatment of diagnosed diseases=10 If none of the options is selected=0	9.2; 3.6	AG_health_ac_c
	Do you give food supplements to them? (including concentrate feeds (grains)	Yes/No for each animal species owned	Yes= 10, no= 0	5.7	AG_health_ac_d



Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
	produced on own farm, purchased concentrated feeds and synthetic supplements)		Average score across species owned		
	Do you keep them grazing on pasture or agricultural lands during part or throughout the year?	Yes/No for each animal species owned and for which the question is applicable	Yes= 10, no= 0 Average score across species owned	10.6	AG_health_ac_e
	Are your animals housed at day and/or night?	Yes/No for each animal species owned	Yes= 10, no= 0 Average across species owned	12.7	AG_health_ac_f
	Use of local seed varieties	Options from list	If only local/native =5 If only new/non native=0 If mix of both =10 If mostly local/native =7 If mostly new/non native =3	2.2; 11.6	AG_new_ac_a
	Use of local animal breeds	Options from list	If only local/native =5 If only new/non native=0 If mix of both =10 If mostly local/native =7 If mostly new/non native =3	2.2; 11.6	AG_new_ac_b
	Are they adapted to current local conditions? (crop varieties)	Yes all/most; yes some; no	Yes all/most =10 Yes some =5 No =0	7.6	AG_new_ac_c
	Are they adapted to current local conditions? (animal breeds)	Yes all/most; yes some; no	Yes all/most =10 Yes some =5 No =0	7.6	AG_new_ac_d
11. Farm inputs	Please indicate how easy it has been for you to access each of the following types of input in the last 12 months:	Options for applicable inputs	Easy=10 A bit difficult=5 Difficult=0 Average score across options	3.1	EC_input_ac_a
	Do you usually have more than one supplier for the selected farm input?	Options for applicable input	Many =10 Only few =5	5.10	EC_input_ac_b

SELF-EVALUATION AND HOLISTIC ASSESSMENT OF CLIMATE RESILIENCE OF FARMERS AND PASTORALISTS (SHARP+)

Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
			No =0 Average score across options		
12. Water access and management	In the past 12 months, how many sources of water did you have access to (please specify sources for household consumption and for agricultural use)?	Number of accessible water sources for each purpose (household consumption, agricultural field irrigation and livestock)	1=0 2=6 3+=10 Average score across three purposes for applicable sources	5.2	EN_wacc_ac_a
	Can your household usually afford to pay the fees (direct payments and/or maintenance fees) for using water for agriculture (e.g. irrigation or livestock)?	List of options	No=0 Rarely=2 Sometimes=5 Often=8 Always=10 No need to pay=10	13.5	EN_wacc_ac_b
	In the last 12 months, did you do anything to improve water conservation in your farm system and household?	Number of water conservation practices used	I did not do anything=0 1=2 2=4 3=6 4=8 5+=10	8.3	EN_wacc_ac_c
	Does your household treat water before drinking it (any treatment method: boiling, allowing to settle, filter, chemical treatment, etc.)?	List of options	No, water is potable/household does not believe treatment is necessary=8 Never, household does not know/cannot afford=0 Rarely=2 Sometimes=5 Often=8 Always=10	12.8	EN_wacc_ac_d



Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
13. Water quality	In the last 3 years, have you observed any of the following processes near your main water sources?	Number of processes options selected from list	0= 10 1= 8 2= 5 3= 2 4+=0	7.7	EN_wqa_ac_a
	What actions has your household taken to deal with these problems?	Number of actions taken to deal with problems (unless not applicable is selected)	Not done anything =0 1=2 2=4 3=6 4=8 5+=10	8.3	EN_wqa_ac_b
14. Soil quality and land degradation	For the main fields you grow crops on, please specify: Main soil colours observed:	Type of colour (not applicable if selected 'other' or 'not able to determine soil colour)	Dark brown=10 Red-brown or orange=5 Yellow=2 Grey=0 If more than one colour selected, average across scores for each selected type	2.9	EN_landqa_ac_a
	Please list the main soil degradation processes you have observed in the last 3 years:	Number of problems options selected from list	No soil degradation observed=10 1=8 2=6 3=4 4=2 5+=0	7.7	EN_landqa_ac_b
	Have you observed any trend in the main process(es) listed	Options chosen from list: increased, remained the same; decreased	Increased=0 Decreased=10 Remained the same=5 Average of the selected options	8 (new)	EN_landqa_ac_e

SELF-EVALUATION AND HOLISTIC ASSESSMENT OF CLIMATE RESILIENCE OF FARMERS AND PASTORALISTS (SHARP+)

Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
	Generally speaking, when water falls on the soil in your fields (e.g. during rain or irrigation), does it...	Option chosen from list: drain normally; drain quickly; does not get absorbed	Drain normally=10 Drain quickly=3 Not get absorbed=0	2.9	EN_landqa_ac_c
	Generally speaking, is the soil on your land soft and easy to till? (even if the farmer does not till)	Yes/ No	Yes=10 No=0	6.3	EN_landqa_ac_f
	Have you seen insects inside the soil in your fields? (e.g. earthworms, termites)	Yes, many Yes, few No	Yes, many=10 Yes, few=6 No=0	2.9	EN_landqa_ac_d
15. Land management practices	In the last 12 months, did you take any actions to improve or preserve the quality of your soil?	Yes/No	Yes= 10, no= 0	8 .1	EN_slm_ac_a
	Which ones?	Number of practices used among list: crop rotation, rotational grazing, fallowing/shifting cultivation, wind break/hedge, intercropping, living fences, liming, vegetative strips, agroforestry, terracing or boundary planting, manuring/composting, gully control/rehabilitation, mulching; cover crops; building earth or soil bunds; planting nitrogen fixing annual or perennial plants	0=0 1=2 2=4 3=6 4=8 5+=10	6.1, 8.1	EN_slm_ac_b
	How do you determine how much fertilizer (synthetic or natural) to apply to your crop(s)?	Options from list	We apply fertilizer based on a careful assessment of our soil and crops (including farmer observation, professional tests, or analyses)= 10	2.6	EN_slm_ac_c



Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
			We apply fertilizer based on general advice for the region or for our crop(s)= 5 Based on how much we can afford without any assessment=2		
	What percentage of your cultivated land is intercropped?	Percentage of land intercropped	1-20%=0 21-40%=4 41-60%=6 61-80%=8, 81-100%=10 unable to estimate =0	6.5	EN_slm_ac_d
	Over the last year, did you use any of the following measures to mitigate the environmental risks associated with the use of fertilizers: (If manuring /composting, urea and/or synthetic fertilizers are selected)	List of options: Avoid application before and after (forecasted) rainfall event Split fertilizer application according to crop uptake Avoid application on steep slopes or in areas prone to flooding Use enhanced efficiency fertilizers (urease inhibitor Use buffer strips along water courses	If one option in the list is selected=5 If two or more are selected=10. Did not use any=0	8.1	EN_slm_ac_e
16. Trees	Do you have any trees on your land?	Yes/no	Yes= 10, no= 0	2.7, 6.2, 8.5	AG_trees_ac_a
	In the last 3 years, was there any change to the number of trees on your farm?	Increased/decreased/remained the same	Increase=10 No change=5 Decrease=0	2.7, 8.5	AG_trees_ac_b
	How would you describe trees and their distribution on your land?	Distribution of trees among the list	Few and scattered=0 Many scattered evenly throughout the land =8 Bordering the land=6	2.7	AG_trees_ac_c

SELF-EVALUATION AND HOLISTIC ASSESSMENT OF CLIMATE RESILIENCE OF FARMERS AND PASTORALISTS (SHARP+)

Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
			Commercial plantation=6 A forested area= 10 Mangroves =10 Other (specify)=5		
	Approximately how many different types/species of trees grow on your land?	Total number of tree species	1=0 2-5=4 6-10=6 11-15=8 16-20=9 21+=10	4.1	AG_trees_ac_d
	In the last 3 years, has the diversity (number of different types) of trees on your land:	Increased/decreased/remained the same	Increased=10 Remained the same=5 Decreased=0	8.5	AG_trees_ac_e
	Do you have access to forest outside your farmland with the possibility to use tree products (timber and non timber products)?	Yes/ No	Yes= 10, no= 0	6.5	AG_trees_ac_g
	In the last 3 years, has it been...	Improved/degraded/remained the same	Improved=10 Remained the same=5 Degraded=0	6.5	AG_trees_ac_h
	Which of the following tree products do you use? (Timber and non-timber forest products) (on-farm trees)	Number of options selected among the following: food product (for people); natural remedies (for animals); natural remedies (for people); products for the protection of crops (e.g. neem); soil fertilizers; craftsmanship; feed products (animal consumption)	0= 0, 1= 4, 2= 7 3+=10	11.4	AG_trees_ac_f
	Which of the following tree products do you use? (Timber and non-timber forest products) (forest trees)	Number of options selected among the following: food product (for people); natural remedies (for animals); natural	0= 0, 1= 4, 2= 7 3+=10	11.4	AG_trees_ac_i



Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
		remedies (for people); products for the protection of crops (e.g. neem); soil fertilizers; craftsmanship; feed products (animal consumption)			
17. Landscape characteristics	What kind of landscape surrounds your main field?	Number of elements excluding "Cultivated area"	1=0 2=4 3=6 4=8 5+=10	6.3; 4.9	EN_lands_ac_b
	What kind of landscape surrounds your main field?	Landscape types selected	Degraded land, Constructed area=0 Cultivated area=5 Pasturelands, planted trees/hedges, wild unmanaged area, tree plantations, grasslands =7 Forest areas, protected natural area, water body, mangroves=10 Score is average of scores for each selected option	7.3	EN_lands_ac_c
	In the last 12 months, have you regularly observed beneficial insects (bees, wasps, ladybugs, ants, etc.) in your fields?	Options from list	Yes many of them=10 Yes, some=7 Barely/ No=0	2.5; 7.3	EN_lands_ac_a
18. Energy sources	Please specify and rank the main energy sources you use for your household and agricultural activities (all sources)	Count out of all options given in the list (for applicable purposes)	1=0 2=6 3+=10	5.3	EN_enerso_ac_b

SELF-EVALUATION AND HOLISTIC ASSESSMENT OF CLIMATE RESILIENCE OF FARMERS AND PASTORALISTS (SHARP+)

Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
			Average across all purposes reported		
	Please specify and rank the main energy sources you use for your household and agricultural activities (environmentally friendly sources)	Environmentally friendly and/or local sources of energy options: Solar, Wind, Biogas, domestic waste, agricultural residues, wood residues, manure	<p>No environmentally friendly option selected= 0 Domestic waste= 4 Agricultural residues= 4 Wood residues= 4 Manure= 4 Wind= 6 Biogas= 6 Solar= 7</p> <p>If, for a given purpose, more than one option is selected, score equals the sum of selected options, up to a maximum score of 10</p> <p>Average score across all purposes reported</p>	2.8, 10.5	EN_enerso_ac_a
19. Energy conservation practices	Do you use any of the following practices to reduce your energy consumption?	Options from list	<p>No practice used= 0 1 (except for 'no practice used')=3, 2 (except for 'no practice used')=7, 3+ (except for 'no practice used')=10</p>	8.2	EN_enercp_ac_a
20. Shocks	In the last 3 years, has your household or farm system been affected by any unexpected climate shock (extreme event)? +	Yes/No	<p>Climate shock: Yes= 10, no= 0 Other shock: Yes= 10, no= 0</p> <p>Average climate and non-climate shocks</p>	7.2	SO_cc_ac_a



Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
	In the last 3 years, has your household or farm system been affected by other types of shocks?				
	Shock/extreme event	Number of shocks reported (climate and non-climate shocks)	1=0 2=10 3=5 4+=0 Average climate and non-climate shocks	7.2	SO_cc_ac_b
	How many times did it happen in the last 3 years?	Number of times the shock was experienced for each type selected	1=0 2=10 3+=5 4+=0 Average across scores for selected disturbances (climate and non-climate shock separately) Average climate and non-climate shocks	7.2	SO_cc_ac_c
	How damaging was this event for your household?	Options	Low-minor=10 Medium-moderate=5 High-major=0 Average climate and non-climate shocks	7.2	SO_cc_ac_d
	Impacts of the most important shock	If "No major change/impact" is selected	No major change/impact=10 Other=0 Average climate and non-climate shocks	7.2	SO_cc_ac_e

SELF-EVALUATION AND HOLISTIC ASSESSMENT OF CLIMATE RESILIENCE OF FARMERS AND PASTORALISTS (SHARP+)

Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
	Which strategies have you tried in the farm to cope with this change? (most important shock)	List of coping strategies implemented:	<p>IF following options selected=10</p> <ul style="list-style-type: none"> • Shift to crop production • Shift to animal production • Change the crop/animal varieties /breeds • Test different land management practices • Test different water management practices • Off-farm employment • Started an education programme (outside agriculture) • Started an education programme (inside agriculture) • Started a business • Borrowed money from cooperative or village fund (community source) <p>IF Relied on aid organizations or government support = 5</p> <p>IF others= 0</p> <p>Average climate and non-climate shock</p>	9.4	SO_cc_ac_i
	Have you and other household members changed behaviour in response to these changing patterns? (e.g. Change in agricultural practices)	Yes/No	Yes= 10, no= 0	9.4	SO_cc_ac_f



Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
	If the worst of the negative events you just mentioned were to occur in the next 12 months, how long do you think it would take for your household to return to a satisfactory situation?	List of options	Less than a month=10 Between 1 and 3 months=7.5 Between 3 and 6 months=5 More than 6 months=2.5 Our household would not be able to recover=0	3.5; 13.1; 13.4	SO_cc_ac_g
	If the worst of the negative events you just mentioned were to occur in the next 12 months, who do you think would be most likely to assist your household?	List of options	Nobody/Don't know =0 Family/relatives, friends, local government, national government, aid organizations, other =7 Insurance company, financial institution =10	3.5; 13.1; 13.4	SO_cc_ac_h
21. Access to information on weather and climate change adaptation practices	In the last 12 months, did you have access to information on future weather and natural events?	Yes/ No	Yes= 10, no= 0	3.3	AG_infoac_ac_a
	In the last 12 months, did you have access to information on cropping/livestock adaptation practices?	Yes/ No	Yes= 10, no= 0	3.3	AG_infoac_ac_b
	Over the past 12 months, did you have access to information on sustainable resource management and agricultural practices?	Yes/ No	Yes= 10, no= 0	3.3	AG_infoac_ac_c
	Where did you access that information? (weather forecasts)	Number of sources (maximum 3 can be selected)	1= 0 2= 8 3= 10	3.3	AG_infoac_ac_d
	Where did you access that information? (Climate adaptation practices)	Number of sources (maximum 3 can be selected)	1= 0 2= 8 3= 10	3.3	AG_infoac_ac_e
	Where did you access that information? (weather forecasts)	Options from this list: extension workers (from government, non-governmental organizations,	If none of these options is selected, score=0 If one option is selected =8 If two or three options=10	9.2, 11.2	AG_infoac_ac_f

SELF-EVALUATION AND HOLISTIC ASSESSMENT OF CLIMATE RESILIENCE OF FARMERS AND PASTORALISTS (SHARP+)

Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
		projects); traditional forecasters/ indigenous knowledge; farmer organizations, coops, community-based organizations; farmer field schools			
	Where did you access that information? (climate adaptation practices)	Options from this list: extension workers (from government, non-governmental organizations, projects); traditional forecasters/ indigenous knowledge; farmer organizations, coops, community-based organizations; farmer field schools	If none of these options is selected, score=0 If one option is selected =8 If two or three options=10	9.2, 11.2	AG_infoac_ac_g
	Overall, how helpful was this information? (weather forecasts)	Usefulness	Very=10 Somewhat=5 Not very much=0	9.2	AG_infoac_ac_h
	Overall, how helpful was this information? (climate adaptation practices)	Usefulness	Very=10 Somewhat=5 Not very much=0	9.2	AG_infoac_ac_i
22. ICTs	Do you have access to any electronic device to access information?	Yes/No	Yes= 10, no= 0	3.3	EC_ict_ac_a
	Select the electronic device that you use	Options from list	0=0 1= 6 2+= 10	3.3	EC_ict_ac_b
	Do you own it?	Yes/ No # of types of devices owned	Yes=10 No=0	12.3	EC_ict_ac_c



Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
			Average Across the selected options		
23. Access to markets	In the last 12 months, were you able to sell the products from your farm system you wanted to sell?	Options: Yes, most of them, Yes, but only few, No	Yes, most of them=10 Yes, but only few products=5 No=0	3.5	EC_mkt_ac_a
	Did you sell your products...	Options: Alone, informal producer group, formally registered producer group	Alone=0 Through an organised producer group (informal)=7 Through an organised producer group (formally registered)=10	1.2; 10.1	EC_mkt_ac_h
	Where did you sell your products?	Number of options selected among the following: local market; cooperative/farmers' organization/ other types of group selling; farmer fair	None of the listed options=0 One of the options=7 Two or more=10	1.2	EC_mkt_ac_b
	Where did you sell your products?	Whether options 'Mainly to an intermediary/dealer' or 'street' options are selected	If only 'Exclusively to an intermediary/dealer' or 'street'=0 If 'Exclusively to an intermediary/dealer' or 'street' are selected but also other options=5 If 'Exclusively to an intermediary/dealer' and street' options are NOT selected=10	10.4	EC_mkt_ac_d
	How do you set prices for the products you usually sell?	Options	Through the cooperative /farmers' organization=10 Price chosen based on available information= 8 I take the market's prices= 5	1.2, 10.4, 3.3	EC_mkt_ac_c

SELF-EVALUATION AND HOLISTIC ASSESSMENT OF CLIMATE RESILIENCE OF FARMERS AND PASTORALISTS (SHARP+)

Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
			The dealer establishes them=0 Other (specify)=N/A		
	Are these prices usually...	Options: low, fluctuating a lot, good enough	Low=0 Fluctuating a lot= 4 Good enough=10	13.3	EC_mkt_ac_f
	Are you involved in any certification scheme to for example increase the price at which you sell your products?	Options	Yes, organic/Yes, fair trade/Yes, origin indication/Yes, other=10 No, but I am currently undergoing a certification process=5 No=0	3.5; 9.5	EC_mkt_ac_e
24. Income sources, expenditures and savings	In the last 12 months, how many different income sources did you have in the household?	Number of income sources	1=0 2=5 3+=10	13.2	EC_inc_ac_e
	Was any of them from a non-farm activity? (e.g. paid labour, cash transfers, charcoal selling, remittances)	Yes/No	Yes= 10, no= 0	4.3	EC_inc_ac_h Former EC_iga_a
	Among agriculture and non-agriculture activities, what was (were) your household's main income source (s)? (please rank them according to importance)	Rank and inclusion of following options: Crop production; livestock production; agroforestry; aquaculture; beekeeping; fishing	If one option from list is ranked as 'main source', score=0 If no option from list is included=10 Final score is the sum of all scores obtained across three sources	13.2	EC_inc_ac_b
	What were your household's largest expenditures and/or investment? (please rank from largest to smallest)	Rank given to options: farm equipment, irrigation infrastructure, breeding animals	If rank 1= 10 If rank 2=7 If rank 3= 5 If not selected= 0	12.6	EC_inc_ac_a
	After these expenditures, were you able to save some money?	Yes/ No	Yes= 10, no= 0	13.6	EC_inc_ac_c



Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
	Can your household afford your children's school fees and school supplies?	Options	No=0 Rarely=2 Sometimes=4 Usually=6 There is no need to pay the fees, but can't afford the supplies=7 Always/There is no need to pay the fees, and can afford the supplies/There is no need to pay the fees or supplies=10	12.6	EC_inc_ac_f
	In the last 3 years, would you say your agricultural activities have been profitable?	Yes/Yes, but not always/No	Yes =10 Yes, but not always =5 No=0	13.4	EC_inc_ac_g
25. Major productive assets	Rank by importance the major productive assets that your household owns	List of options	We do not own any=0 1 option except for 'I do not own any'= 4 2 options except for 'I do not own any'= 7 3 options except for 'I do not own any'+= 10	13.4; 4.6	EC_ass_ac_a
26. Access to financial services	In the last 3 years, has your household ever needed external financial support when faced with unexpected expenditures?	Yes/No	Yes= 10, no= 0	7.9	EC_fin_ac_a
	Have you been able to receive the support?	Yes/ No	Yes= 10, no= 0	13.1, 1.5	EC_fin_ac_b
	What was (were) the main source (s) of support?	# of options selected	1=0 2=7 3+=10	5.9	EC_fin_ac_c
	What was (were) the main source (s) of support?	Types of providers	If "Traders or shopkeepers" and/or "Dealer/ Supplier" is selected=0	4.6	EC_fin_ac_d

SELF-EVALUATION AND HOLISTIC ASSESSMENT OF CLIMATE RESILIENCE OF FARMERS AND PASTORALISTS (SHARP+)

Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
			Other selected option =10		
27. Insurance	Are your goods (e.g. crops, livestock, land) insured (financially protected) against loss or damage?	Yes/ No	Yes= 10, no= 0	13.5	EC_ins_ac_a
28. Community cooperation	Did you join other community members to address the problem?	Yes/No	Yes= 10, no= 0	1.3, 10.1	SO_coop_ac_a
	In your community, do you have customary mechanisms in place to deal with problems within and/or across communities?	Yes/No	Yes= 10, no= 0	1.3, 10.1	SO_coop_ac_b
	Which ones?	If 'Elder's committees/ councils' is selected	Elder's committees/ councils =10 Other=0	11.3	SO_coop_ac_c
	Do you usually trust members of your community to help you in times of need?	Options	Yes, always=10 Yes, most of the times=7 Yes, sometimes=4 No=0	3.4	SO_coop_ac_d
	Do you feel that some households in your village/area have different economic or political opportunities than others linked to their religion or ethnic/minority group?	Options	No =10 Yes, a few households=8 Yes, less than half the households=6 Yes, about half the households=4 Yes, more than half the households=0 Don't know = 0	3.4	SO_coop_ac_e
29. Group membership	Are you, or any other member of your household, member of any groups, organizations or associations?	Yes/ No	Yes= 10, no= 0	1.1	SO_group_ac_a
	Are you, or any other member of your household member of any groups, organizations or associations?	Whether a person participates in either of the following group:	0= 0 1 (of the list)= 7, 2+ (of the list)= 10	9.1	SO_group_ac_d



Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
		(Agro-pastoralist/Farmer) Field School, Agricultural producer's group (including marketing groups); Livestock producer's group (including marketing groups); Fisheries producer's group (including marketing groups); Water users' group; Watershed management group; Forest users' group; Tree Nursery Group 29.1=yes			
	Were any of these groups initiated by your community?	Yes/ No 29.1=yes	Yes= 10, no= 0	1.1	SO_group_ac_b
	Please list the types of groups you (or another household member) actively participate to	# of different groups	0=0 1=5 2=7 3+=10	4.4	SO_group_ac_c
	Why do you (or household member) belong to this group?	Number of options selected among: Sharing experiences; Learning/training; Testing new practices; Access to information (e.g. markets, weather); Meet other farmers; Meet experts (e.g. researchers)	None from the list=0 One of the list=7 Two+=10 Total score is average for each group selected	9.1	SO_group_ac_e
	Does your community organize any festival linked to key moments of the season (e.g. coinciding with harvest, planting, flowering)?	Options	Yes, and it is a meaningful event for the community=10 Yes, although it is not as important as it used to be=7 No, they have disappeared=4 No, we never had them=0	12.7	SO_group_ac_f

SELF-EVALUATION AND HOLISTIC ASSESSMENT OF CLIMATE RESILIENCE OF FARMERS AND PASTORALISTS (SHARP+)

Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
			I don't know=0		
	Are you (of the household member) the leader of any of these groups? 29.1=yes	Yes/No	Yes= 10, no= 0	12.3	SO_group_ac_g
30. Meals	Did anyone in the household eat the type of food in question over the last day and night?	Yes/ No for each food category in list. There are 12 categories of foods, so HDDS goes from 0 to 12	If HHDS= 1, score= If HHDS= 2, score= 1 HHDS= 3, score= 2 [...] If HHDS= 11+, score= 10.	4.7, 12.1	SO_meal_ac_a
	Where do you usually source your food from?	Diversity of the sources selected	1= 0 2 =5 3=7 4+=10	10.8	SO_meal_ac_d
	In the last 12 months, have you been able to stock food to be used later in the year (e.g. cereals, tubers)?	Options	Yes, throughout the year=10 Yes, only during/after the harvest time=7 Other=5 Not at all=0	5.6	SO_meal_ac_b
	Do you have access to a cereal bank in your community?	Yes/ No	Yes= 10, no= 0	5.8	SO_meal_ac_c
	Do you have any granary/storage facilities at home?	Yes/ No	Yes= 10, no= 0	12.3	SO_meal_ac_e
31. Decision-making (Household)	(1) What portion of these decisions are made by men? + (2) To what extent did you feel you can participate in the decisions?	(1) For each question asked options include: All or most; About half; Few or none, Not applicable (2) (if applicable) For not at all, small extent, medium extent,	For (1) All or most=0 About half=10 Few or none=0 Average of score for each applicable question For (2) not at all=0 small extent=3	12.5	SO_dmhh_ac_a



Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
		to a high extent, prefer not to say	medium extent=6 to a high extent=10 Average of the (1) & (2) for each applicable question		
	What portion of these activities are shared between men and women?	Options: All or most; About half; Few or none, Not applicable	All or most=10 About half=5 Few or non=0 Average of score for each applicable question	12.5	SO_dmhh_ac_b
32. Decision-making (Farm management) <i>Only for 3.1 = agriculture or livelihood</i>	(1) Who makes the decision? + (2) To what extent do you feel you can participate in the decisions?	(1) For each question asked options include: Yourself, your partner, you and your partner jointly, other relative jointly you and other relative; other unrelated person (2) For not at all, small extent, medium extent, to a high extent	For (1) All or most=0 About half=10 Few or none=0 Average of score for each applicable question For (2) not at all=0 small extent=3 medium extent=6 to a high extent=10 Average of the (1) & (2)	12.5	SO_dmfarm_ac_a
	What portion of these activities are shared between men and women?	Options: All or most; About half; Few or none	All or most=10 About half=5 Few or none=0 Average of score for each applicable question	12.5	SO_dmfarm_ac_b
33. Government policies and	In the last 3 years, have you or other household members participated in any	Yes/No	Yes= 10, no= 0	9.3: 12.8	GO_gov_ac_a

SELF-EVALUATION AND HOLISTIC ASSESSMENT OF CLIMATE RESILIENCE OF FARMERS AND PASTORALISTS (SHARP+)

Theme	Question	Unit	Score	Agro-ecosystem indicator	Code database
programmes on climate change and sustainable agriculture	government programme or project related to climate change and/or sustainable agriculture? 33.1=yes				
	Who participated in these policies or programmes? 33.2=yes	Options	All household members similarly=10 Only men=0 Only women=5	12.5	GO_gov_ac_d
	If yes, please indicate what services and benefits you received from participation to the programme/project 33.2=yes	Options	Education/training =10 Cash transfers/In kind support=5 Provision of information (e.g. surveys, census) =0 Legal advice (e.g. resource management) =7 Other (Specify)=5 Average across selected options	12.8	GO_gov_ac_b
	Has there been any forest management initiatives at community level? (e.g. afforestation of reforestation projects)	Yes/No	Yes= 10, no= 0	1.4	GO_gov_ac_e
	In the last 3 years, have you participated in any other project or programme?	Yes/No	Yes= 10, no= 0	9.3: 12.8	GO_gov_ac_c



Annex D

Guidance material for using SHARP+ in the field

D1. Tips for facilitation of SHARP+ in the field

This section provides some advice to enumerator to facilitate SHARP+ in the field.

Preparing for data collection (prior to the field visit)

Being familiar with the questionnaire	<ul style="list-style-type: none"> Enumerators need to go through all the modules in the version of SHARP+ they will be using. A dry-run questionnaire needs to be done to understand the flow of the questionnaire and the type of information that every module aims to collect. For each module, enumerators should look at the options and identify the most likely responses in the location and community where data collection will take place. If there some are missing, enumerators can flag it to the SHARP team to incorporate these.
Preparing the facilitation in the local language(s)	<ul style="list-style-type: none"> Enumerators need to be aware of the local names of the trees, crops and animal species mentioned throughout the questionnaire. They should ensure to have the translation of key terms and concepts into local language ready before going to the field. A glossary of terms should be developed during the training. Short guidance is provided defining key technical terms within selected modules. If additional definitions are needed, these can be added for use during the field activities.
Preparing standard metrics and conversions	<ul style="list-style-type: none"> The team of enumerators should prepare a common list of local metrics and standard conversion systems. The systems will be used to convert local units (e.g. currency, weight, distance and surface) into standard units (i.e. USD/Kilograms/meters/hectares). As the survey needs to be completed using standard units, this activity will ensure that all data collected in different places is comparable.

Before starting the interview (in the field)

Individual and group setting	<ul style="list-style-type: none"> Using an individual (one-on-one) interviews with respondents is recommended as this has multiple advantages. Individual
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	<p>settings protect the privacy of respondents, help speeding-up the assessment and can allow enumerators the time for short breaks in-between interviews.</p> <ul style="list-style-type: none"> ● Group setting (one-to-two or three) may allow richer discussions among respondents and could increase the accuracy of responses (mutual verification). However, enumerators need to be aware that respondents may influence each other when responding, leading to inaccurate information, especially regarding sensitive questions.
Interacting with respondents	<ul style="list-style-type: none"> ● Enumerators should prepare a short introduction of themselves, clearly stating the purpose of the interview and the project. Ideally the introduction is done in the local language and will also serve to ask the consent of the respondent to before starting the survey. ● The respondents must know that the information they provide is confidential and will be only used for project and research purposes. Sensitive data will never be shared. ● Enumerators should not raise respondents' expectations when introducing the survey and the project. Based on prior discussions with the project manager, enumerators should explain clearly the implications of responding to the survey to respondents without committing potential retribution that are not envisaged. For instance, financial or other compensation for the respondents' time, whether their households are likely to become beneficiaries of the project, etc.
Introducing "resilience"	<ul style="list-style-type: none"> ● Enumerators should avoid using very technical terms as the word "resilience", as the term means different things to different people. It is suggested to other terms/phrases that are closely linked to the meaning of resilience and may results in a less vague understanding. For instance, using "bouncing back", "getting by", "fully prepare for", "make face to", "cope with" and others are might result clearer to understand and translate across local languages. Enumerators can also use examples or comparisons to explain the concept and then ask those who coped well with shocks how they did it. At the end, respondents should understand why resilience is relevant.
Discussing climate change with farmers	<ul style="list-style-type: none"> ● Enumerators should focus on overall changes in climate, not on a hazard-specific assessment. While climate change can be



	<p>exemplified by the different shocks farmers are experiencing (e.g. droughts, floods), isolating as a single event throughout the assessment is often difficult and may bias the results. A farmer's ability to deal with a single shock (e.g. drought) will be affected by a whole set of different factors, including other types of stressed (such as food price spikes or pest outbreaks).</p>
Introducing SHARP+	<ul style="list-style-type: none"> Enumerators may describe what the SHARP+ tool is, its purpose, the steps of using it, and the time it will take to complete the survey.
During the assessment	
The order of modules	<ul style="list-style-type: none"> Although the succession of modules is designed to enhance respondents' understanding of questions, enumerators can ask questions in different order or in different sessions. To do so, being familiar with the survey is key. Enumerators should ask and explain questions slowly, using local languages to ensure the understanding of them by respondents.
Reading the questions verbatim	<ul style="list-style-type: none"> Questions should not be necessarily read as they appear in the questionnaire, as they can be very technical and sometimes bulky. Thus, enumerators should understand what type of information the question intends to extract and then interpret it using colloquial language to allow a good understanding by the respondents. Time references provided along the questionnaire (e.g. in the last 3 years, over the last 12 months) are used and need to be respected when asking the questions as they are used for monitoring purposes.
Spelling out options	<ul style="list-style-type: none"> When dealing with multiple option questions, enumerators should let respondents reply by themselves. If they do not know the answer or if there is a sense of forgetting common options, spell-out the response options to ensure that all information is captured.
Encourage good discussions	<ul style="list-style-type: none"> Alternating questions and discussions with respondents is a good practice to ease the data collection process. Enumerators should remind respondents that remarks are welcome during the interview.

	<ul style="list-style-type: none"> Enumerators can integrate interactive exercises, for instance when estimating surfaces and try to use metaphors linked to common situations to explain difficult and abstract concepts, such as resilience or climate change.
Self-assessed adequacy questions	<ul style="list-style-type: none"> The adequacy question explores the level of satisfaction of respondents with respect to a given resource or aspect of their farm system or community. For instance, it asks farmers whether they consider the resources, practices and access to different features (e.g. markets, water sources) are good/sufficient/adequate enough to conduct their farm activities or to achieve food security. Enumerators need to take some time to understand these by looking at the questions across different modules.
Self-assessed importance module – priority ranking	<ul style="list-style-type: none"> The self-assessed importance module tries to capture respondents’ own priorities. Enumerators must carefully listen to their concerns by order of importance and try to match them to one or more of the SHARP+ aspects offered in the list. If not present, there is a possibility to suggest a new area that needs to be included by selecting “other”. The aim of this module is to understand what farmers consider as crucial to improve their capacity to respond to shocks and improve their livelihoods.
Ranking of self-assessments	<ul style="list-style-type: none"> Enumerators should encourage respondents to focus on rating the level of adequacy and importance from ‘little’ to ‘lots’, instead of having very long discussions. This can be facilitated by letting respondents illustrate responses using 5 stones/seeds (one stone= low priority / low adequacy, 5 stones= top priority).
Importance of using shorthand note taking	<ul style="list-style-type: none"> Writing long sentences is time consuming. Using shorthand note taking (approximately from 1 to 3 words) helps to speed-up the survey process. As with the metrics and conversion units, common keywords can be defined by enumerators before data collection.
After the assessment	
Acknowledge participants	<ul style="list-style-type: none"> Enumerators should thank respondents for their time and acknowledge their vital contribution for the development of the project or study.



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- | | |
|--|---|
| | <ul style="list-style-type: none">• If envisaged, enumerators or project team should reimburse respondents for their collaboration. |
|--|---|
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Facilitation of specific modules

General Information: in the question ‘*Who is the head of household*’ remember to clearly specify whether the respondent or his/her spouse (or another person) is the head of the household. Households where both women and men are considered as the head can be present as well.

Global Positioning System (GPS): if the automatic built-in GPS location button does not work due to low signal availability, the location can be inserted manually with the use of a GPS device. If there is none available, then the number 1111 can be introduced to be able to move forward with the survey.

Land Access: for some populations in specific countries (e.g. Angola or Tanzania), land is a communal source, i.e. there are not legal rights to own private land and most of it belongs to the State or cooperatives. In this case, enumerators should leave the “private land” option empty and only focus on communal/government land options.

Crop (seasonal and perennial): respondents tend to forget about all the crops that people in their household cultivated over the previous season or the past 12 months. It may help asking respondents to think about: crops for horticulture, crops cultivated by women, crop cultivated in other seasons, etc., to make sure no crop species is forgotten. Remember to check that the list of crops reflects local crops. When needed, prepare a list of the crop names in local languages.

Soil and Land Degradation: soil colours and texture types coupled with water drainage characteristics are key elements to consider when deciding which cultivation fits better the soil. When many different colours and textures are mentioned referring to the main field(s), ask respondents to choose the most predominant if the options are not present in the list.

Trees: the aim is to have an estimate of the density and diversity of trees present in the farm, including eventual changes occurred during time.

Nutrition: the aim of this module is to have an understanding on the diversity of farmers’ diets. You do not have to read all the food items listed there, but instead, you could ask the farmer “could you tell me what you had for breakfast, lunch and dinner in the last day?”, then you can classify and record all the food items listed.

Household and Farm Management decision-making: these questions are sensitive as they aim to detect the ways in which tasks are divided between men and women within the household. As such, the questions need to be asked in private and individually so to avoid that the respondent feels intimidated.

Module: _____

Module: _____



D2. Getting acquainted with SHARP+ data: Guidance note on how to manage and analyse SHARP+ data

What is survey data analysis?

It refers to the process of analysing the results from surveys, such as SHARP+. Surveys can be face-to-face interviews or conducted through the web or phone calls. The length, the frequency and the quality of the survey will depend on how it is designed by the project team or researcher and how it is implemented in the field.

Why to analyse survey data?

Survey data alone mean nothing if it is not properly analysed. Thus, the project team through the data analyst or monitoring and evaluation expert must ensure all the information collected provides rigorous evidence for decision-making. The results from SHARP+ aim to inform programmatic and policy decision-making that will help improving farmers' resilience through a better understanding of their livelihoods and resilience drivers.

There are multiple ways of analysing survey data, both using manual methods or through specialized statistical software, which is discussed later.

Types of data collected through SHARP+

SHARP+ collects quantitative and qualitative data through the questionnaire. The levels at which the data is collected are household and individual.

Quantitative data is information that refers to aspects that can be counted, thus it is reflected in numbers with specific units of measurement (e.g., kilos, hectares, number of income sources). Usually, these data are gathered through the actual measurement of given aspects (e.g., land extension accessed, weight of crops produced) and are analysed through numerical comparisons and statistical inferences³⁰. SHARP+ collects this information through close-ended questions, suggesting pre-set units of measurement. For instance, in the module on Land access the farmer is asked "how much land did you have access to for your agricultural/pastoral activities? (total amount of hectares)".

³⁰ Statistical inference is the process in which data is used to draw conclusion or deduce properties an existing population through the data gathered.

On the other hand, **qualitative data** is descriptive and refers to aspects that can be observed but not measured, such as the types of practices carried-out in the farm, access to resources or the self-perceptions of adequacy of a given aspect. SHARP+ uses qualitative questions to gain understanding of human behaviour from the farmers' perspective, through a combination of close-ended and open-ended questions. For instance, the question "what practices have you used to manage pests and plant diseases?" offers a list of a wide variety of management practices, including biological methods, synthetic pesticides, mechanical practices, among others.

Getting acquainted with the SHARP+ dataset

After finalizing data collection in the field and transferring all the data to a computer, the data analyst will find himself/herself with a large Excel sheet filled with the different entries/farmers interviewed (rows) and data codes based on the responses provided by them (columns). Before proceeding with the analysis, the data analyst must understand the content and how to treat the different information to ensure that the the wealth of data is maximized.

a) Data cleaning: missing information and doubled survey entries

Before start managing the actual data, it is important to clean the dataset. This is a key step to ensure having a good data quality before analysing the SHARP+ data. The data cleansing will mostly consist of deleting the double survey entries (if any) or dropping those surveys that are not fully completed, for instance, test surveys or questionnaires that were started by mistake but never completed.

SHARP+ is programmed to only allow fully completed surveys to be the uploaded onto the server. However, it can be the case that some surveys are incomplete at the time of the upload, particularly if applicability rules were not duly set when creating the survey.

The data analyst can also take this step as an opportunity to homogenize certain data (e.g. make sure the community names are well entered) and cluster it into different groups (e.g. by control and beneficiary groups, by community) as needed. Also, certain binary responses, such as "true/false" or "yes/no" can be replaced with numbers (one and zero respectively) to facilitate the analysis and perform cross-tabulations.

b) The codes

Following good practices in household surveys, SHARP+ domains, modules and questions are coded in a systematic way to ease their identification in the dataset. The first two letters in every SHARP+ code refers to the domain to which the module belongs as follows:



- The modules belonging to the environmental domain start with an “EN”.
- The modules belonging to the economic domain start with an “EC”.
- The modules belonging to the social domain start with an “SO”.
- The modules belonging to the governance domain start with a “GO”.

A label is assigned to the module and it follows the domain prefix. This is usually a short name of the modules’ titles or an acronym. For instance, the module “crop production” will be identified with the label “crop”, whilst the module “pest management practices” will be labelled as “spm”. Since both belong to the environmental domain, these can be found by typing “EN_crop” and “EN_spm” respectively. Table A 1 below presents SHARP+ coding system.

After the module name, there will be a series of labels that aim to identify the question response under study. These labels are intuitive as to allow for a quick recognition of the question being asked. For instance, the question on post-harvest practices within the crop module is labelled as “EN_crop_postharvest”, which is preceded by the type of practice being used, e.g. “EN_crop_postharvest_consumption” for immediate consumption, “EN_crop_postharvest_clean” for cleaning the produce, “EN_crop_postharvest_sorting” for sorting the produce and so on.

Thus, the data labelling follows the structure below:

Domain prefix + Module’s title label/acronym + Response label

c) Resilience-related codes

For the resilience scoring components, each of these are identified with a label that is applicable to all modules. The technical (objective) component has the suffix “ac”. Since the final technical score is usually composed by different aspects within the same module as seen in Annex B, each scored item will be listed with an alphabet letter, starting with “a” and following an ascending order. For instance, the crop module contains six different scoring items, being identified as EN_crop_ac_a, EN_crop_ac_b and until EN_crop_ac_f.

As the final technical score consists of the average of multiple items scored (refer to the scoring table in Annex B), the code of this can be recognized through the label “ac_average”. For instance, the final technical for crop module is “EN_crop_ac_average”.

The self-assessed adequacy can be identified with the suffix “adq”. For example, this component in the crop production module will be found as “EN_crop_adq”.

Table A 1 offers a schematic representation of SHARP+ coding system that can help the analyst familiarize with the dataset.

Table A 1. SHARP+ coding system

Domain name	Prefix	Module name	Label	Technical (average)	Adequacy
Environment	EN	Crop production	crop	EN_crop_ac_average	EN_crop_adq
		Weed species and management	weed	EN_weed_ac_average	EN_weed_adq
		Pest management practices	spm	EN_spm_ac_average	EN_spm_adq
		Livestock production practices	animal	EN_animal_ac_average	EN_animal_adq
		Livestock breeding practices	breed	EN_breed_ac_average	EN_breed_adq
		Livestock nutrition and health	health	EN_health_ac_average	EN_health_adq
		Water access and management	wacc	EN_wacc_ac_average	EN_wacc_adq
		Water quality	wqa	EN_wqa_ac_average	EN_wqa_adq
		Soil quality and land degradation	landqa	EN_landqa_ac_average	EN_landqa_adq
		Land management practices	slm	EN_slm_ac_average	EN_slm_adq
		Trees	trees	EN_trees_ac_average	EN_trees_adq
		Landscape characteristics	lands	EN_lands_ac_average	EN_lands_adq
		Energy conservation practices	enercp	EN_enercp_ac_average	EN_spm_adq
Shocks	cc	EN_cc_ac_average	EN_cc_adq		
Social	SO	Household characteristics	hh	SO_hh_ac_average	SO_hh_adq
		Agricultural production activities	agr	SO_agr_ac_average	SO_agr_adq
		Land access	landac	SO_landac_ac_average	SO_landac_adq
		Access to information on weather and climate change adaptation practices	infoac	SO_infoac_ac_average	SO_infoac_adq
		Information and communication technologies	ict	SO_ict_ac_average	SO_ict_adq
		Community cooperation	coop	SO_coop_ac_average	SO_coop_adq
		Group membership	group	SO_group_ac_average	SO_group_adq
		Nutrition	meal	SO_meal_ac_average	SO_meal_adq
		Decision-making (Household)	dmhh	SO_dmhh_ac_average	SO_dmhh_adq
		Decision-making (Farm management)	dmfarm	SO_dmfarm_ac_average	SO_dmfarm_adq
Economic	EC	Farm inputs	input	EC_input_ac_average	EC_input_adq



Domain name	Prefix	Module name	Label	Technical (average)	Adequacy
		Energy sources	enerso	EC_enerso_ac_average	EC_enerso_adq
		Access to markets	mkt	EC_mkt_ac_average	EC_mkt_adq
		Income sources, expenditures and savings	inc	EC_inc_ac_average	EC_inc_adq
		Major productive assets	ass	EC_ass_ac_average	EC_ass_adq
		Access to financial services	fin	EC_fin_ac_average	EC_fin_adq
		Insurance	ins	EC_ins_ac_average	EC_ins_adq
Governance	GO	Government policies and programmes on climate change and sustainable agriculture	gov	GO_gov_ac_average	GO_gov_adq

How to analyse your data collected with SHARP+?

a) What does the project want to learn through SHARP+?

The data analyst, together with the project team, need to know why they are using SHARP+ for, i.e. have a set goal for the survey, as this will determine how the information will be analysed and the results interpreted (see subsection 5.2 in the handbook for more details on how to set the purpose of the survey).

For instance, a project with focus on land degradation issues might be interested in knowing the main degradation processes affecting farmers, as well as the number of farmers being affected by them. To respond to the questions, the project would include the module on “Land quality and degradation”.

In an example from a project in Namibia where 161 farmers were interviewed, the survey results revealed that 73 percent of farmers (118) in the project sites had noticed soil and land degradation process on their farmlands. Out these 118 farmers, erosion from wind (34 percent of responses) was the main land degradation process observed. The percentages in this example show the number of respondents that answered whether they had observed degradation or not in the last 3 years (quantifiable data), as well as the type of processes observed (qualitative information) as a proportion of the number of people who answered the question.

Table A 2. Example of SHARP+ data tabulation

Question	No. of respondents (N=161)	% of respondents
Farmers not observing land degradation problems	43	27%

Question	No. of respondents (N=161)	% of respondents
Farmers observing land degradation problems	118	73%
Out of which (multiple selection):		
Erosion (wind)	40	34%
Erosion (water)	17	14%
Fertility decline	21	18%
Compaction	10	8%
Waterlogging	13	11%
Other degradation processes	17	14%

b) Filtering results by cross-tabulating subgroups

Following the objectives of the project or study, the design of the survey and data analysis plan should include the criteria of respondent groups that need to be interviewed (e.g. gender, community, productive system, age group, land use type). This is important in order to decide the sample size and how the data will be analysed and reported.

Thus, at this step of the analysis the analyst will compare the groups of interest. For this, cross-tabulations are useful to present the answers per question and that are disaggregated by each subgroup.

The table below shows an example of the number of income sources disaggregated by the sex of the household head.

Table A 3. Example of SHARP+ data cross-tabulation by sex of the household sex

Income sources	Male-headed households	Female-headed households	Dual-headed households
1 source	82%	86%	76%
2 sources	14%	9%	19%
3 sources	4%	5%	5%
N=	57	106	150

Through this example it can be noticed that most households – regardless the gender of the head - rely on a single source of income. However, when comparing the three of them, dual-led



households tend to have more diversified income sources, whereas women-led households have the lowest number. This is revealed by the 24 percent of dual-headed households having two or more income sources compared to only 14 percent of women-led families.

Data can also be filtered by community and gender simultaneously for a more refined analysis. It is important to note that the **disaggregation of data into smaller groups will reduce the sample size**. Thus, when computing cross-tabulations there is need to check that the sample size is valid enough to make statistical inferences.

A sample size calculator³¹ can be used during the planification of the field assessment and data analysis to ensure that the results are statistically significant.

c) Scrutinizing the data

Usually when using SHARP+ for resilience studies, practitioners and researchers tend to look at overall resilience levels (e.g. using the 13 agro-ecosystem indicators or by thematic module), without looking into detail at the rest of the data gathered.

The data collected not only helps to **determine the resilience levels** of the farmers and communities assessed, but also to **understand how these populations live, what are their main features, which strategies are in place to build resilience and which actions can be taken to strengthen and address resilience gaps**. It is strongly advised that to have a thorough look at the survey questions to have a precise understanding of what is being asked and – to the extent possible – have a good knowledge of the populations the project/study is targeting. The following questions are suggested to conduct a more in-depth study:

- What are the most common responses to questions “X, Y, Z”?
- What are the main differences between women and men respondents? And among the different communities?
- Are there Indigenous groups being interviewed? Which ones?
- What did respondents in group “D” say?
- Which group of respondents are most affected by issue “Z”?
- Have farmers noticed any change in issue “Z” through project interventions?
- What are the resilience scores of module “L”?

³¹ There are several sources available online, including survey monkey’s sample size calculator: <https://www.surveymonkey.com/mp/sample-size-calculator/>

- What is the share of the population presenting the lowest resilience scores? Which aspects need to be addressed?
- What are the aspects that farmers rated as of high importance?

Due to the nature of the data, **different sections of the population (strata) can be compared**, such as two groups of respondents (e.g., by gender) and **in different points in time** (particularly important for monitoring and evaluation). The disaggregation of information allows to look at particular topics and track progress by asking questions such as “what are the land management practices being used among farmers in community X?”, “are men and women having the same adoption rates?”. If the survey is conducted at different stages of the project cycle, following the example, evaluation questions can include “has the number of women adopting sustainable land management practices increased after the project and as a result of it?”.

The results can be further discussed using focus group discussions (see Annex D5 for more details) to understand the why (e.g., the barriers, motivations) in the questions being asked.

d) Using survey weights in data analysis

When analysing the SHARP+ data, the analyst needs to know whether there is need to use survey weights. These are values that are assigned to each individual surveyed and are usually used improve the representativeness of the population interviewed. The weights will tell how much each unit surveyed (i.e., the farmer, the household) will count in a statistical analysis. Weights are always positive and different from zero. To exemplify this, a weight of three means that each unit will count in the dataset as three identical units (proportion 3:1). On the other hand, a weight of one means that the case only counts as one case in the dataset (proportion 1:1). Weights can be, and usually are, fractions (1/2:1)

The most common weights are:

- **Design weights:** These are usually used to balance for cases of under- or over-sampling or when the strata (groups) sampled are disproportionate. The use of these weights helps ensuring that the statistics generated through the analysis are representative of the actual population under study. For instance, when we are surveying minority groups (e.g. ethnic groups, pastoral populations, women-headed households) within a larger population group that predominantly differs from these, it is a common practice to select a larger sample (over-sample) of such groups. If the size of the sample is tripled from minority groups with respect to the broader population (i.e. using a proportion 3:1), then each individual in that area would get a design weight of 0.3 to ensure the results of these individuals are an actual representation of the whole population under study and not an over estimation.



- **Non-response or post-stratification weight:** This type of weight is used to balance for cases in which individuals with certain characteristics (e.g., gender, education level, ethnicity, age) are not as likely to respond to the survey than others. For example, often household surveys in rural settings have substantially more female respondents than male ones. This is the case since women tend to oversee domestic activities, increasing their likelihood of being present at home at the time of the interview. Because the survey over-represents female respondents and under-represents men respondents in the population assessed, using weights during the analysis is needed to compensate for this imbalance and reduce biases in the results.

A weight the value of zero should be avoided when conducting the analysis, unless there is an explicit intention to exclude a group from the analysis. Likewise, if there is enough information on how the sample is designed, for example using a proportion 3:1, then the weight will be the inverse of these number, i.e. 1/3 or 0.3. If there are no over- or under-sampled cases in the survey, then the weight will be equal to one by default. Statistical software for data analysis, including Excel, offer the option to generate weights as needed.

When conducting the analysis, only one weight per case can be used. If there is need weight for different factors, these weights must be combined together into a single weight.

e) **Cross-check and complement the analysis with other type of data**

Once you the analysis of SHARP+ data is completed, it is important to cross-check the tabulations and results with other data sources, such as census information or other household surveys. Usually, these datasets are not fully available and not always up to date, but these may help the analyst and team spot any inconsistencies throughout the analysis and address them in a timely manner (e.g. population characteristics such as age or education, production practices in the assessed area).

Also, it is crucial to verify any inconsistencies with enumerators or field project staff to ensure that the results are of high quality and that interpretation does reflect the realities in the field.

When presenting the results, it is important to outline whether the findings come from a statistically significant study (e.g. such as the SHARP+ survey used for M&E), whether the survey only covers some communities / populations, or if the information comes from a different source (e.g., other survey or census data).

Tools for survey data analysis

Traditional survey analysis tends to be highly manual, thus prone to errors, particularly when handling large datasets, as the one resulting from SHARP+. One option to mitigate this risk is to use statistical software to guarantee that all the data are properly managed and to reduce

potential analytical errors and time to process it. Specialized statistical software can allow the automatization and replication of the process as many times as needed.

Below there is a non-exhaustive list of software examples the analyst could use to clean, manage and analyse the SHARP+ data:

- Microsoft Excel ®: The software is easy to use and allows to apply several statical functions needed to provide a clear description of the data. The tool also allows to generate pivot tables and to create graphs and charts to visualize the results.
- NVivo ®: It is a tool that can be used to store, organize, categorize and analyse data and also create visualisations of the results. NVivo also allows to exchange data with SPSS for further statistical analysis. NVivo works online and a free trial is available on their website.
- SPSS ® and STATA ®: Both are specialized software designed for advanced statistical analysis. The user will require some knowledge on programming and multiple dedicated user guides are available online. However, both require a paid license.
- R ®: It is a free software environment for statistical analysis and data visualization. As with SPSS and STATA programming skills are needed to manage data through the software.
- Saiku Analytics ®: It is a free-of-charge software that helps the user to explore complex data sources. The interface used drag and drop features which facilitate the analysis of data. The tool also helps to conduct basic statistical analysis (percentages, counts) and provides good data visualisations.

D3. Guidance matrix for interpretation of resilience assessment results

This section offers a general guidance on how to read and interpret the results of the technical (objective) scores obtained after the completion of a survey. These guidelines also aim to support users and analysts to easily understand how the technical scores are built to measure “objective resilience”.

This guide offers an explanation when the technical components show high scores, i.e. high resilience is observed. When scores are low, then the inverse scenario should be considered. However, the interpretation of the average technical score of each module needs to be done carefully as it results from the combination (average) of various elements. Therefore, the user should identify which element(s) within the average technical score is (are) driving its overall direction.



Table A 4. Interpretation of the technical scores by module

Module	What does high technical resilience score indicate?
2. Household	<ul style="list-style-type: none"> ● Elders or experienced household members actively contribute to the education of children, particularly passing on information on agricultural practices. ● Low percentage of household members unable to work due to age or health reasons (over 10 percent for a score of 7 points or more). ● Gender equality in access to school represented by a high ratio of girls (between 0 to 15 years) who are literate over boys' value (if ratio is equal to or larger than one, then 10 points are assigned). ● High percentage of household members who are literate (over 50 percent for a score over 7.5 points). ● Household members have access to education.
3. Production activities	<ul style="list-style-type: none"> ● Farmers carry out many different activities within the same farm unit. ● There are multiple purposes for agricultural production (both selling and on farm-consumption for most activities)
4. Land access	<ul style="list-style-type: none"> ● Households have access good access to land accessible. More than 1 ha gives a score of 6 points. ● Farmers have access to "public" land to practice agriculture, either communal lands, forestland and pastureland. ● Farmers have access to private land for agriculture.
5. Crop production	<ul style="list-style-type: none"> ● Crop production is distributed over several crop systems. ● At least half of the cultivated land is intercropped. ● Crops are associated with livestock in the same space and at the same or different time. ● Several crop species are cultivated on the same field, including seasonal and perennial (more than 4 crop species). ● There is a large diversity of varieties cultivated across the selected crop species. ● Farmers are able to source their seeds and plants from different means (three or more types gives a score of 10 points).

Module	What does high technical resilience score indicate?
	<ul style="list-style-type: none"> ● Producers know how to manage the products after harvesting to reduce losses and increase production value (depending on options selected, penalized for immediate consumption only option). ● Farmers have a large share of land cultivated with multiple crops at the same time (intercropping is selected with over 40 percent of land gives a score of 6 points). ● The respondent uses leguminous plants and/or trees. ● Farmers uses a significant percentage of native/local crop varieties. ● Varieties used (local and new) are well adapted to current local conditions.
<p>6. Weed management practices</p>	<ul style="list-style-type: none"> ● Farmers have observed a controlled number of weeds in the field and used some practices among the following to manage it: cover crops, hand weeding, hoe weeding, crop association and livestock grazing. If at least two practices are selected, a score of 7 points is given.
<p>7. Pest management practices</p>	<ul style="list-style-type: none"> ● Households faced pest problems in their fields and have taken actions practices to them. ● Different practices are used by farmers to manage plant diseases and pests (at least 2 practices for a score of 6 points or above). ● Natural/biological methods are used to manage diseases and pests (biological pesticides, biological control methods, manually catching the pests; using traps; increased biodiversity around the fields). ● Farmers do not use synthetic pesticides. ● Farmers look for pests or disease before applying pesticides. ● When synthetic pesticides are used, farmers practice correct pesticide disposal. ● Farmers use of protective gear when applying synthetic pesticides (if only used sometimes the score is 5 points).
<p>8. Animal production practices</p>	<ul style="list-style-type: none"> ● Producers have different animal species (at least three to have a score of 7 points) ● Producers have more than one breed per species (score of 5 points if farmers have more than one breed for at least one species) ● Farmers uses a significant percentage of native/local animal breeds.



Module	What does high technical resilience score indicate?
	<ul style="list-style-type: none"> • Breeds used (local and new) are well adapted to current local conditions.
9. Animal breeding practices	<ul style="list-style-type: none"> • Farmers use different sources of animal breeds. • Farmers have tried to breed better animals on farm.
10. Animal nutrition and health	<ul style="list-style-type: none"> • Animals have experienced health issues, and the farmer has been able to consult experts (e.g. veterinary services or local knowledge) to manage animal diseases. • Respondents have vaccinated the livestock when needed. • Food supplements are given to livestock. • Animals are kept grazing on pasture or agricultural lands at least during part of the year. • Animals have housing if needed.
11. Local farm inputs	<ul style="list-style-type: none"> • Households can easily access a large range of farm inputs. • Households have access to more than one supplier for most inputs.
12. Water access and management	<ul style="list-style-type: none"> • Households have several accessible water sources for each purpose, including household, irrigation and livestock (at least two for each purpose is selected for a score 6 points). • Households usually afford to pay the fees for using water for agriculture. • Farmers use several practices and techniques to preserve the quantity of water (at least three practices for a score of 6 points).
13. Water quality	<ul style="list-style-type: none"> • Farmers use practices and techniques to preserve the quality of water (at least three practices for a score of 6 points). • Few water quality problems are encountered (maximum of two problems for a score of 5 points).
14. Soil quality and land degradation	<ul style="list-style-type: none"> • The soil is rich in organic matter (dark-brown colour is mostly observed). • The soil on farm is able to retain and drain water adequately during rain or irrigation. • Only few land degradation problems have been observed (maximum two issues for a score of 6 points) and trends in these are not increasing. • The soil has a good texture for tilling (even if the farmer does not till).

Module	What does high technical resilience score indicate?
15. Land improving practices	<ul style="list-style-type: none"> ● The soil is rich in microbiota, as seen by presence of earthworms, termites etc. <hr/> <ul style="list-style-type: none"> ● Farmers have taken any action to improve the quality of their land/soil and in particular at least three of the following practices: crop rotation, rotational grazing, fallowing/shifting cultivation, wind break/hedge, intercropping, living fences, liming, vegetative strips, agroforestry, terracing, manuring/composting, gully control/rehabilitation, mulching, cover crops, and building soil bunds. ● Farmers use at least three practices which increase temporal and spatial heterogeneity such as: crop rotation, rotational grazing, fallowing/shifting cultivation, wind break/hedge, intercropping, living fences, liming, vegetative strips, agroforestry, terracing, manuring/composting, gully control/rehabilitation, mulching, cover crops, building earth or soil bunds, manuring and animal urea (three practices are selected give a score of 6 points). ● Farmers check for need of fertilisers before using them. ● Farmers are able to produce their own organic fertilisers, such as compost.
16. Trees	<ul style="list-style-type: none"> ● Households have trees on their farmland and the number of trees has increased in the last three years. ● The density of trees is high. ● Several tree species are present on the land (at least six species for a score of 6 points). ● Different tree products are used showing good knowledge of tree production and forest management (at least two products used for a score of 7 points). ● Households have access to forests and these are not degraded.
17. Landscape characteristics	<ul style="list-style-type: none"> ● Beneficial insects (bees, wasps, ladybugs, ants, etc.) are regularly present in the fields indicating a healthy ecosystem. ● The field is surrounded by different types of landscape elements which provide refuges for diverse species and increase heterogeneity of landscape. ● Especially good score if following elements surround the land: pastureland, planted trees, hedges, wild unmanaged area, tree plantations, used wetland (e.g. for cropping, pasturing), forest patch, protected natural area, water body, mangroves, protected wetland.



Module	What does high technical resilience score indicate?
18. Energy sources	<ul style="list-style-type: none"> ● Farmers use of environmentally friendly sources of energy for household and agricultural purposes, including solar, wind, biogas, domestic waste, agricultural residues, wood residues and manure. ● At least three different energy sources are available for each purpose.
19. Energy conservation practices	<ul style="list-style-type: none"> ● Farmers use different practices to save energy (at least two practices selected give a score of 7 points).
20. Shocks	<ul style="list-style-type: none"> ● The household has been exposed to unexpected shocks, generally more than one type of shock and more than once. These have occurred for a relatively short period of time with no major negative impacts on the household. ● Members of the households have learned from the past and changed their behaviour following the disturbance. ● Households would be able to recover in a short time after the shock and would be able to access support for recovery.
21. Access to information on weather and climate change adaptation practices	<ul style="list-style-type: none"> ● Households have access to information on future weather and natural events and it obtains the weather forecasts from at least two sources of information (for a score of 8 points). ● Score is higher when these sources include extension workers, traditional forecasters/indigenous knowledge, farmer organizations, cooperatives, community-based organizations and farmer field schools. ● The weather information obtained is considered very helpful. ● Households have access to information on cropping/livestock practices and it obtains the information on practices from at least two different sources (score of 8 points) ● Score is higher when these sources include extension workers, traditional forecasters/indigenous knowledge, farmer organizations, cooperatives, community-based organizations and farmer field schools. ● Information on cropping/livestock practices is considered very helpful. ● Households have access to information on sustainable resource management and agricultural practices.
22. Information and	<ul style="list-style-type: none"> ● Households have access and use one or more electronic device such as telephone, internet access, television and radio, to access information.

Module	What does high technical resilience score indicate?
communication technologies	<ul style="list-style-type: none"> ● Households have ownership of a number of electronic devices.
23. Access to markets	<ul style="list-style-type: none"> ● Farmers are able to sell most of their agricultural products when desired. ● Farmers are organised to sell their products (e.g. through a farmer organization). ● Farmers sell their products in local markets, through cooperative/farmer organizations, other types of group selling, farmer fairs, rather than selling to intermediaries, dealers or in the street. ● Farmers have access to information on market prices and set prices through the cooperative/farmer organizations or based on available information. ● Farmers are involved in certifications schemes to increase the production value. ● Prices at which farmers sell their produce are good enough to make a profit. ● Most or all the products sold in the last 12 months were paid on time.
24. Income sources, expenditures and savings	<ul style="list-style-type: none"> ● Households are engaged in non-farm activities to generate income. ● Households make investments on the farm. ● Households can afford education (fees and/or supplies). ● Agricultural activities (crop production, livestock production, agroforestry, aquaculture, beekeeping, fishing) are the main sources of income for the households, indicating the profitability of the activity. ● Households can afford education and school supplies. ● Households are able to save some money after taking care of its expenses. ● Households have increased their savings over the past three years. ● Agricultural activities have been profitable most times in the past three years.
25. Major productive assets	<ul style="list-style-type: none"> ● Households own different productive assets (at least two assets for score of 7 points).
26. Access to financial services	<ul style="list-style-type: none"> ● Over the past three years, households have been able to cope with unexpected expenditures without the need of external financial support. ● Households have been able to receive financial support when needed.

Module	What does high technical resilience score indicate?
	<ul style="list-style-type: none"> ● Household have been able to stock food (cereals, tubers, etc.) to be consumed throughout the year. ● Household source their foodstuff from different sources (at least three different sources for a score of 7 points).
<p>31. Household decision-making (household)</p>	<ul style="list-style-type: none"> ● Decisions in the households are made jointly between female and male members, in particular between the household head and his/her partner. ● Household members feel that they can participate to a good extent in decisions concerning the household management. ● Both men and women spend about the same time in household activities.
<p>32. Household decision-making (farm management)</p>	<ul style="list-style-type: none"> ● Decisions concerning agricultural activities are made jointly between female and male members, in particular between the household head and his/her partner. ● Household members feel that they can participate to a good extent in decisions concerning the management of the farm. ● Both men and women spend about the same time in farm activities.
<p>33. Government policies and programmes on climate change and sustainable agriculture</p>	<ul style="list-style-type: none"> ● Farmers are part of the government initiatives on sustainable agriculture and climate change. ● Farmers have been part of projects and programmes other than agriculture with equal access to all household members. ● Farmers received services such as education, training and legal advice from the programmes (score of 7 points).



D4. How to build the 13 agro-ecosystem indicators for resilience assessment

The SHARP+ application itself does not offer the automatic visualization and calculation of the 13 agro-ecosystem indicators, as for project design these concepts remain abstract and hard to operationalize and to interpret from a farmer viewpoint.

However, with the use of the scoring table in annex C, the technical scores can be easily calculated for a further manual computation of the 13 agro-ecosystem indicators.

One option to calculate these is to use the scoring table that is presented by indicator (Annex C), where all the questions that contribute to each indicator are outlined. In this option, some questions are assigned to several indicators, which can lead to artificial correlations between indicators during further statistical analysis. The codes only include those elements belonging to the technical score that are used for measuring resilience. In order to include adequacy scores as well, each score should be assigned to an indicator according to its relevance. This option might result very useful, particularly if the scoring system is adjusted based on the project or research needs.

A second option is to use the table below containing all the codes as exported from the SHARP+ tool and that are needed to calculate every agro-ecosystem indicator. The codes are extracted from the scoring table and also only include the technical scores. In this table, each question has been assigned to the most relevant indicator in order to avoid artificial correlation mentioned above.

The codes highlighted in green correspond to all the mandatory modules that contribute to the construction of the indicators; whilst those codes in white reflect the non-mandatory modules. Therefore, the green-shaded codes shall always be present in the computation of the indicators, while the white-shaded codes might or might not be part of this computation, which will depend on the survey design.

The calculation of the 13 agro-ecosystem indicators using the table below should follow the next steps:

1. **Identify which modules were used to conduct the resilience assessment**, particularly those that are optional and were integrated as part of the survey.
2. With the use of the table below, **highlight all the mandatory and optional modules used**.

- Tip: discard (delete) all the white-shaded codes that are not part of the assessment; this will help avoid confusion when calculating your scores.

3. Identify the codes in the dataset.

- Tip: using “Ctrl + F” in Excel can help finding these quickly.
- Tip: while identifying each of the codes, a tab in the Excel file can be created for each indicator to organize better organize the results.

4. Calculate the average of each of the indicators. To do this, sum all the numbers from the codes and divide by the number of codes used to calculate the indicator.

- Note: remember the number of codes will vary depending on the number of non-mandatory modules used. For instance, to calculate indicator 11, the total should be divided by nine if the module on access to information is included, or by seven if this module is excluded, as it has two scoring contributing to the indicator (see tips in step two)
- Tip: the result of the indicator should not exceed 10 as this is the maximum achievable of each of the scoring components. If the individual score or average is higher, then there might be a miscalculation in the average or in the individual scored components.

Table A 5. Interpretation of the technical scores by module

Indicator	Codes of the technical scores
1	SO_landac_ac_b, EC_mkt_ac_h, EC_mkt_ac_b, SO_coop_ac_a, SO_coop_ac_b, SO_group_ac_a, SO_group_ac_b, GO_gov_ac_e
2	EN_crop_ac_a, EN_crop_ac_k, EN_new_ac_a, EN_new_ac_b, EN_landqa_ac_a, EN_landqa_ac_c, EN_landqa_ac_d, EN_slm_ac_c, EN_trees_ac_b, EN_trees_ac_c, EN_lands_ac_a
3	EC_input_ac_a, EN_cc_ac_g, EN_cc_ac_h, SO_infoac_ac_a, SO_infoac_ac_b, SO_infoac_ac_c, SO_infoac_ac_d, SO_infoac_ac_e, SO_ict_ac_a, SO_ict_ac_b, EC_mkt_ac_a, EC_mkt_ac_e, SO_coop_ac_d, SO_coop_ac_e
4	SO_agr_ac_a, EN_crop_ac_b, EN_spm_ac_c, EN_animal_ac_c, EN_animal_ac_a, EN_health_ac_b, EN_trees_ac_d, EC_inc_ac_h, EC_ass_ac_a, EC_fin_ac_d, SO_group_ac_c
5	SO_landac_ac_a, EN_crop_ac_c, EN_crop_ac_d, EN_crop_ac_l, EN_animal_ac_b, EN_breed_ac_a, EN_health_ac_d, EC_input_ac_b, EN_wacc_ac_a, EC_enerso_ac_b, EC_fin_ac_c, SO_meal_ac_b, SO_meal_ac_c



Indicator	Codes of the technical scores
6	EN_crop_ac_m, EN_landqa_ac_f, EN_slm_ac_b, EN_trees_ac_a, EN_trees_ac_g, EN_trees_ac_h, EN_lands_ac_b
7	EN_weed_ac_b, EN_spm_ac_a, EN_spm_ac_b, EN_animal_ac_f, EN_health_ac_a, EN_new_ac_c, EN_new_ac_d, EN_wqa_ac_a, EN_landqa_ac_b, EN_lands_ac_c, EN_cc_ac_a, EN_cc_ac_b, EN_cc_ac_c, EN_cc_ac_d, EN_cc_ac_e, EC_fin_ac_a
8	SO_landac_ac_e, EN_crop_ac_i, EN_crop_ac_n, EN_spm_ac_d, EN_spm_ac_g, EN_animal_ac_d, EN_animal_ac_g, EN_animal_ac_h, EN_wacc_ac_c, EN_wqa_ac_b, EN_landqa_ac_e, EN_slm_ac_a, EN_slm_ac_d, EN_trees_ac_e, EN_enercp_ac_a
9	EN_health_ac_c, EN_cc_ac_i, EN_cc_ac_f, SO_infoac_ac_f, SO_infoac_ac_g, SO_infoac_ac_h, SO_infoac_ac_i, SO_group_ac_d, SO_group_ac_e
10	SO_agr_ac_b, EN_breed_ac_b, EN_health_ac_e, EC_enerso_ac_a, EC_mkt_ac_d, EC_mkt_ac_c, SO_meal_ac_d
11	SO_hh_ac_g, EN_crop_ac_g, EN_spm_ac_e, EN_animal_ac_e, EN_trees_ac_f, EN_trees_ac_i, SO_coop_ac_c
12	SO_hh_ac_b, SO_hh_ac_d, SO_hh_ac_c, SO_hh_ac_a, SO_hh_ac_e, SO_hh_ac_f, SO_hh_ac_i, SO_hh_ac_j, SO_hh_ac_h, EN_spm_ac_i, EN_spm_ac_h, EN_health_ac_f, EN_wacc_ac_d, SO_ict_ac_c, EC_inc_ac_a, EC_inc_ac_f, SO_group_ac_f, SO_group_ac_g, SO_meal_ac_a, SO_meal_ac_e, SO_dmhh_ac_a, SO_dmhh_ac_b, SO_dmfarm_ac_a, SO_dmfarm_ac_b, GO_gov_ac_a, GO_gov_ac_d, GO_gov_ac_b, GO_gov_ac_c
13	SO_landac_ac_c, SO_landac_ac_d, EN_crop_ac_e, EN_crop_ac_f, EN_crop_ac_j, EN_wacc_ac_b, EC_mkt_ac_f, EC_inc_ac_e, EC_inc_ac_b, EC_inc_ac_c, EC_inc_ac_g, EC_fin_ac_b, EC_ins_ac_a

D5. Sharing SHARP+ assessment results with communities

Why is it important to share the SHARP+ assessment results with communities?

Sharing the assessment results and findings with local communities enables their access to data, which in turn was only made possible through their participation in the survey. Sharing this knowledge can help **communities can gain ownership of the findings and** use these to define their own goals for resilience building, while protect their own interests. The increased ownership is likely to positively influence impact of project/programme interventions and reach the expected goals.

By sharing and discussing the results with communities, projects and research aiming for community empowerment and seek an active community engagement throughout the project cycle, can also mitigate the challenges of survey-based assessments through more participatory approaches. This is particularly important as surveys can be very extractive from the community perspective.

Interaction between the community and decision-makers (e.g., project and programme managers) presents a learning opportunity for both. On the one hand, community members have the chance to interact with the findings, corroborate and validate these. On the other hand, decision-makers can directly learn from communities to refine strategies and interventions, while decreasing the likelihood of having negative unexpected results based on community feedback.

Appropriate and timely dissemination of data and results can contribute to reducing the gap that usually exists in decision-making between projects and communities. Inclusive planning and decision-making may enhance trust and empowerment of community stakeholders.

How to bring the SHARP+ results back to the communities?

There are some key considerations to keep in mind when bring back the SHARP+ results to the community members. Five steps are considered as core to ensure an interactive process that provide benefits for both communities and project team to gain understanding and ownership of the results and learn how these can be best used for an informed decision-making.

Step 1. Identification of key results and areas for discussion

Based on the results, the project field staff, researchers and the evaluation team (if applicable), henceforth referred as project team, should identify those areas highlighted with low and high resilience levels and of high priority for participants. Based on the wealth of information



collected, the team should try to understand the drivers of resilience to identify the main gaps (e.g. barriers to access productive assets, knowledge, services) and opportunities for action.

This step will also allow the project team to understand about the main concerns and priorities of communities themselves, and beyond from project's own objectives.

Aside from resilience gaps, the project team should identify other information that can be crucial to be shared with communities. This, to improve the interpretation of results (i.e., understanding the "why") and support an inclusive decision-making process for the formulation of relevant and context-specific interventions. For instance, a project focused on addressing land and soil degradation can discuss on the findings related to land access and tenure situation, land degradation processes observed, ongoing practices used by farmers to improve land quality and barriers for their adoption and tenure right situation of women and members of minority groups.

Step 2. Development of communication strategies for sharing the results

After identifying the key information areas to be shared, appropriate strategies to communicate basic statistics (e.g. the ones produced and presented in the results report) and expected changes over time (e.g. temperatures, land use change) should be developed in order to share the results with communities.

For example, the project team can use posters with simple charts (e.g., bar graphs or pie charts) and with pictures farmers can relate to. Limited text should be used in the material prepared, in order to facilitate the understanding by those with reduced literacy. It is important that the text used in any material is available in local languages to ensure it is comprehended by everybody.

Step 3. Preparation of a presentation of the results and the guided discussion

Before approaching the communities, a presentation should be prepared using all the visual materials needed. The presentation should evolve around a participatory and engaging guided discussion of key findings. The presentation needs to be appropriate to the audience, i.e. considering their specific characteristics, such as gender, literacy levels, group age, income level and ethnicity. The statistics comprised within the presentation should be customized to each community.

In close consultation with the communities participating in the project, the interactive presentation will aim to include all available community members and population groups in the different locations covered during the assessment. The presentation not supposed to last more than three hours, as it should focus on key information that will better inform the main project or research objectives (see step 1).

Ideally, a presentation should be organized in every assessed community to maximize the reach of the data and the findings, as most community members are unlikely to travel to another town to participate in the data sharing presentation. However, aware of the time and financial resources implications, focus group discussions could be set in order to improve the efficiency of the process.

Step 4. Presentation of the results and discussion with farmers

Focus group discussions can be organized (e.g. by gender, land tenure situation, socioeconomic status) as needed to address specific topics or concerns that are particularly sensitive and/or to be tackled as part of the project. For example, if the project aims to foster women participation in value chains, groups of women can be organized to discuss their current involvement levels and the main role they bare (e.g., in production, post-harvest practices, marketing) and what are the main social, cultural and economic barriers they currently face.

The discussion of each aspect should include:

- A brief introduction about the current situation on this topic, for instance, based on the SHARP+ assessment results and other information available to the project
- An overview of changes in the community in past years and/or any expected changes in the future
- An open dialogue with community stakeholders and a period for reflection

During the open discussion, it is strongly advised that facilitators who are well knowledgeable of the community/area, guide the conversation in the local language so participants can easily engage in the discussion. Community members should have an opportunity to provide comments, to question findings and to have the chance to validate these and their interpretation.

Step 5. Record discussion and report on main discussion outcomes

It is advised that the feedback from communities is recorded to have a registry that can always be consulted and to increase accountability. During the project formulation and monitoring, the analysis of these recordings presents an opportunity to get a deeper understanding on the perception of communities regarding the assessment, the results and the project itself.

The recording should be done by the project team, for example by using a paper form to be completed by facilitators immediately after the discussions. The form could have information on the topics discussed, specific findings and social dynamics.



The recording should also contain a section on the priorities and concerns of communities that the project could address, and which is particularly relevant in the case of a SHARP+ baseline survey or a needs-assessment. If SHARP+ was used for evaluation purposes, the discussions and feedback form could contain information related to the success (or failure) project activities and their impact on communities' livelihoods.

The presentation and discussions can also be recorded using voice or video devices, ensuring with prior and informed consent from all participants.

How to use the community discussions information?

All the data gathered through the group discussions can be used in different ways:

- to identify the capacity and other needs, gaps and barriers in the targeted communities;
- to understand the strategies currently used by communities as a whole to build their resilience and that the project can foster to boost its impact;
- to learn about communities' priorities and concerns regarding specific topics;
- to inform the design and refine project interventions that are suitable to the communities and the population groups within these;
- to refine the SHARP+ tool for continued learning and assessment, particularly if used as part of the project's monitoring and evaluation system;
- to identify bottlenecks in ongoing projects so these can be timely addressed, especially during monitoring activities; and
- to analyse evolution in resilience levels and adaptive capacity of farmers before and after the project. This is particularly useful in the context of monitoring and evaluation, when the project team aims to learn about the direct impact of the interventions on communities.

D6. Outline of SHARP+ report

The below presents a general outline of a report to be followed when presenting the main results. The outline can and should be modified based on the project/study objectives and target audience.

Section	Content
1. Introduction	Provides an overview of the project/study and its objectives. This section also includes an introduction of the SHARP+ tool, explaining what it is and how it has been used as part of the study.
2. Methodology	Presents the methodology followed for the analysis of the data, including the sampling strategy and data collection method.
3. Household characteristics	This section offers an overview of the households interviewed, including sex and age of the respondents, distribution of household by project site and presence of Indigenous Peoples. The section should provide to readers a good understanding of the main socioeconomic characteristics of population under study.
4. Profiling of livelihoods	All the information collected will be presented in a structured manner, for instance, dividing the section by domains (social and economic characteristics, environmental features and governance mechanisms). The analysis of all the modules within each domain will include tabulations and charts and information should be disaggregated as needed (e.g. by gender or community).
5. Resilience assessment	<p>This section presents a thorough analysis of the resilience levels of the populations assessed. This implies the identification of the main resilience gaps as well as the high resilient aspects, offering an indication what are the main drivers of the trends and patterns observed.</p> <p>It is encouraged to include a resilience analysis disaggregating by gender (of the respondent or the sex of the household head) and by geographical area. The analysis should also include a subsection on farmers' own prioritization for resilience building.</p>
6. General recommendations	Resilience building recommendations can be included in this section, following the resilience analysis, including farmers' priorities, and profiling of livelihoods. The recommendations should be jointly developed with the project team and relevant technical experts.
7. Annexes	Tabulations, qualitative reports and questionnaire version used for data collection can be included in this section.



D7. Sampling guidance

Defining a correct and robust sampling strategy when planning a SHARP+ assessment is key to ensure that representative and reliable conclusions of a target population are derived.

In practical terms, a successful sampling strategy involves defining how data collection will be organized (where, who, what and how) to fit the overall research/project purpose. The selection of the sampling strategy will depend on the objectives of the project, the context and the type of the research. This document presents the most suitable potential strategies when using SHARP. However, this document is not exhaustive, and the expertise of the monitoring and evaluation expert or lead researcher is required when designing the data collection plan and activities.

In probability methods, all persons/sample units in the target population have the same chances of being interviewed, while in non-probability sampling methods, the sample units do not have equal chances of being selected. Independently from the type of research conducted, the researcher must have a clear question driving the data collection. In the case of SHARP+, the study unit is the household, which is represented by a member answering the questions on behalf of the household.

Probability sampling methods:

As a rule of thumb, probability sampling should be used in social sciences for household surveys in order to be able to generalize the results to a wider population. Few terms are needed before exploring the different probability methods:

- Sample frame: this comprises the documentation or information (lists, population census, surveys) used to select the study sample.
- Sample area: a selection of geographical area units within the sample frame.
- Target population: the part of the population the research aims to draw generalization for.
- Sample unit: the unit used for the research/project (e.g. a project might target households, hence the sample unit will be the household and not the single individuals living there. Another study might target only farms; hence the farm is the sample unit).
- Study sample: The sample of a study simply refers to the participants who are chosen through a sampling strategy.

Probability sampling methods are mainly used in quantitative studies and as such they allow generalizations from collected data. Probability sampling involves the calculation of the probability of an individual in a given community/place to be selected, which means that every sample unit (household, individuals, farms ...) enjoy the same chance of being selected. This is the reason why only probability sampling methods can be used to draw conclusions on the entire target population.

Main probability sampling methods:

- **Simple random sampling:** having created a numbered list (1=.; 2=.; 3=.; n) of all the units in the target population (e.g. people living in the district "X") and decided the size of the sample, the researcher randomly selects the actual people to be interviewed (Microsoft Excel ® has a dedicated function for this).³²
- **Systematic sampling:** in this method, after creating a numbered list, the study units are selected at regular intervals from the sampling frame starting from a randomly selected number. Based on the sample size, the researcher divides the target population (y) by the sample size (n), obtaining the interval to use (t). He then randomly picks a number between 1 and t, which represents the starting point, then adds t to it and selects the next one, until they select all the sample size.

Formula :

Interval (t) = y/n Start: random number between 1 and t.

- **Stratified sampling:** this aims at avoiding the representation of only a certain group/category of the target population. It consists of dividing the population into sub-groups (strata) which are different to each other but share similar characteristics within the group. Stratification allows the researcher to obtain data from different subgroups. The most common example for stratification is to divide the population of a certain administrative region (province, region, state) into urban and rural strata. The two strata have different characteristics, but the households within each of the strata tend to be similar (e.g. in terms of household size, gender, agricultural production system, Indigenous groups, socioeconomic status).

³² For more information on how to use this excel function, please consult this link: <https://www.surveymonkey.com/mp/random-sample-in-excel/>



- **Cluster sampling:** cluster sampling is based on an already available list of units (e.g. villages, districts, irrigation sites). The selected units represent the clusters for the analysis, which will tend to be rather similar to each other i.e. homogeneous (the opposite of stratified sampling). To achieve reliability, it is advisable to create a large number of clusters with few people rather than few clusters with many people (e.g. if the sample size is 1000 households, instead of having 50 clusters of 20 household each, it is suggested to have 100 clusters of 10 households each). This is especially true for geographically determined clusters (e.g. districts, villages) where similar characteristics in the variables within each cluster are present (types of employment, income level) and the generalization possibilities are thus limited.

Overall, four main components are taken into consideration when designing an effective sampling strategy:

- a) Setting a geographical sample area. This is the geographical area in which the surveys will take place, following the project targeted areas.
- b) Setting the sample frame. Available population census or surveys can be used, as well as cadastre information and remote sensing imagery as the material from which to select the population sample. It is very important to select the population sample using only probability methods (without excluding parts of the population) to avoid biases in the results. This will ensure obtaining meaningful information in the sample area and allow for data comparison among the different project sites. Ultimately, this data will help decision-making to develop tailored solutions, programmes and policies.
- c) Definition of the target population. The target population will be selected based on selected criteria (e.g. production activities, income level and gender) and that are located in the geographical sample area.
- d) Selection of the sample size. This is the total number of people (units) to be interviewed and the larger the sample size, the more representative the results will be. Usually in social sciences, the definition of the size uses a 95 percent confidence level and a 5 percent confidence interval.

BOX 12

Improving Resilience to Climate Change in South Sudan

Building Resilience and Adaption to Climate Extremes and Disasters (BRACED) was a three-year programme aiming to help people to become more resilient to climate extremes across a number of countries. In South-Sudan, BRACED worked at multiple levels, supporting the development of household, community and national resilience to climate extremes and disasters. The areas of field implementation were the former states of Northern Bahr El Ghazal (NBeG) and Warrap, covering three counties (Aweil West, Aweil North and Tonj South). The focus of the project in these areas was to develop households' capacity to adapt, to absorb and anticipate climate extremes and disasters with a particular focus on the most vulnerable, especially women and children. In this context, SHARP was used to monitor the evolution of resilience in project areas. An endline assessment as well as FGDs and interviews with key informants were undertaken between autumn 2017 and spring 2018. This combination of quantitative and qualitative methods allowed them to complement the results, validating SHARP data as well as exploring interesting or unexpected outcomes and better understanding the drivers of resilience.

Baseline assessment

Following the South-Sudan administrative division in state, county, *payam* and *boma*, a random selection process was used to target five *payams* within the three project counties. To be able to generalize the results, the samples size for the baseline was calculated using a 90 percent confidence interval (CI) and 10 percent of confidence level. Using these parameters, a total of 668 households were selected for interviews across the five *payams* selected.

State	County	Payam	Males	Females	Sample Size
NBeG	Aweil West	Gomjuer Centre	43	92	135 (90% CI)
	Aweil North	Malual North	58	57	115 (90% CI)
Warrap	Tonj South	Tonji	196	222	418 (90% CI)
		Agugo			
		Manyang-ngok			
Total	BRACED programme areas		297	371	668

The next step in the sampling process was to randomly select a representative number of *bomas* within each county, and to allocate the sample size in a proportional way (according to the target population of each county). In this context, the accessibility of the *bomas* was a key aspect to consider. As such, if a given randomly selected *boma* was not accessible (e.g. for logistic reasons or ongoing conflicts), a different *boma* was randomly selected.

[Box break]



Endline assessment

For the endline assessment, the decision was to exclude, as per the baseline assessment, *bomas* that were not accessible (i.e. due to ongoing conflicts). The design effect was similarly taken into account. Based on the random selection of households, less than 5 percent of them were likely to be the same respondents of the baseline data collection. Thus, it was not possible to follow-up on the same people surveyed during the baseline assessment. However, since the baseline sample size was statistically relevant, it was possible to generalize the baseline results to measure the impact of the BRACED project on resilience levels.

State	Baseline sample size	Endline sample size
Aweil North and Aweil West	250 (90% CI)	116 (90% CI)
Tonj South	418 (90% CI)	154 (90% CI)
Total	668 (90% CI)	270 (90% CI)

Qualitative assessment

The BRACED team had additionally collected primary qualitative data using a mix of workshops, focus group discussions (FGD), key informant interviews (KII), and group or paired interviews. The combination of quantitative (baseline and endline assessments) with qualitative methodologies enabled the project to gain more insights on the drivers of resilience in the selected South Sudan sites and on the beneficiaries' perceptions regarding the impact of the project.

Participants	Method	Location	Number of participants
BRACED beneficiaries and SHARP endline survey respondents – female	Workshop	Aweil –Nyamlell	16
BRACED beneficiaries and SHARP endline survey respondents – male	Workshop	Aweil –Nyamlell	15
BRACED FFS Lead Farmers	Group interview	Aweil West	3
Concern FSL management	KII	Aweil – Nyamlell	1
Concern BRACED field staff – workshop translators/facilitators	Debrief	Aweil –Nyamlell	4
BRACED beneficiaries and SHARP endline survey respondents – male	FGD	Tonj South – Khartoum Jidid	13
BRACED beneficiaries and SHARP endline survey respondents – female	FGD	Tonj South – Khartoum Jidid	11
BRACED beneficiaries and SHARP endline survey respondents – male and female	FGD	Tonj South – Wargiir	11
BRACED beneficiaries and SHARP endline survey respondents – female	FGD	Tonj South - Rungangou	8
BRACED beneficiaries and SHARP endline survey respondents – male	FGD	Tonj South - Rungangou	8
BRACED beneficiaries and SHARP endline survey respondents – male and female	FGD	Tonj South - Akuceng	12
ACTED FSL management and M&E	Paired interview	Tonj South	2

Annex E

Survey questions for the evaluation of SHARP+

The FAO-developed SHARP+ tool has been launched in 2017 and the SHARP team is interested in learning more about its performance in the field. By filling-in this 15-question survey, you will help us understand better how it has been used and what needs to be improved for projects and beneficiaries.

i. Name (not mandatory)

ii. E-mail address (not mandatory)

iii. Country of use *

iv. Which application version did you use? *

- SHARP+ (dev-surge: sharp-dev.surge.sh) on the tablet/phone
- SHARP+ (dev-surge: sharp-dev.surge.sh) on the browser
- SHARP+ Collect Mobile
- Not sure
- Other: _____

v. Approximately, how many people were interviewed? (number of surveys conducted) *

- 50 or less
- 51 to 100 surveys
- 101 to 200 surveys
- 201 to 300 surveys
- More than 300 surveys
- Not applicable (e.g. I'm a project coordinator / project designer)

1. Did you receive training to use SHARP+ in the field? *

- Yes, by a member of the SHARP team (FAO HQ)
- Yes, by another SHARP expert (i.e. from FAO but based in an office outside HQ)



- Yes, by a master trainer (i.e. Trainer of Trainers)
- No, I read the relevant documentation and received general guidance by the SHARP team
- No, I learned about the tool by reading the documents without any additional support
- Not applicable (e.g. I am a project coordinator / project designer)
- Other: _____

2. For what purpose(s) did you use SHARP+? *

- Research (e.g. case studies, MSc/PhD thesis)
- Design of project interventions to strengthen resilience
- Select beneficiaries / areas of interventions to strengthen resilience
- As a monitoring tool in climate-related projects
- As an evaluation tool in climate-related projects
- As an M&E tool in other types of projects
- Other: _____

3. What was your role in the use of the tool? *

- M&E expert
- Project Staff
- Project Designer
- Data collection (e.g. research associate, enumerator)
- Government counterpart
- NGO
- Independent researcher
- Other: _____

4. Were you involved in the data analysis, interpretation and/or reporting? *

- Yes, in the three steps
- Yes, but only in the data analysis part
- Yes, but only in the interpretation and reporting

- No, but someone from the national team was involved
- No, the SHARP team in FAO HQ (Rome) oversaw these activities
- No, and I was not meant to – I only took care of data collection
- No, and I was not meant to – I was part of the project coordination/implementation team
- Other: _____

5. On a scale from 1 to 5 (5 being very completely), does the tool present the outcomes in an easy and understandable way? *

- 1 (Not at all)
- 2
- 3
- 4
- 5 (Completely)

6. In your experience, what was (were) the main advantage(s) of using SHARP+ (i.e. over other tools)? *

- It is easy to use
- It is flexible so it allows for customization
- It is very comprehensive and rich in content
- It is relevant to the project objectives / indicators
- If needed, allows for participatory assessment and discussion of the results
- Works on a tablet and offline
- Collects geo-referenced information
- Allows to interact with different stakeholders (e.g. during the training and in interviews)
- Other:

7. In your view, what (were) the major challenge(s) when using the application? *

- It is very long and time consuming
- The language is very technical, difficult to understand and translate



- There were technical difficulties using the application (e.g. GPS did not work, failing at submitting data, the app is too slow)
- There were technical difficulties using the tablet (i.e. the quality of the equipment was low, the screen was too small, the battery did not last long)
- I did not understand well the methodology and its scope
- The questions are not relevant to understand resilience
- It is too expensive for implementation (e.g. logistics, translation, training)
- I did not understand the results and/or how to use them
- It is not participatory enough
- Other: _____

8. On a scale from 1 to 5 (5 being very), do you consider the results of the tool precise? *

- 1 (Not at all)
- 2
- 3
- 4
- 5 (Very)

9. Based on the tool outcomes, how do you think SHARP has contributed to the project? *

- It has allowed the identification of areas of interventions and beneficiaries (targeting)
- It has supported the design of better interventions through data for evidence-based project formulation
- It has helped the identification of bottlenecks, so we were able to address them in a timely manner (monitoring)
- It has allowed a better understanding of livelihoods in the field
- It provided valuable information to understand farms' resilience status and determinants
- It has not contributed the communities in any way
- Not applicable (e.g. it was used for research purposes only)
- Other: _____

10. On a scale from 1 to 5 (5 being completely), was SHARP's expected use met? *

- 1 (Not at all)
- 2
- 3
- 4
- 5 (Completely)

11. On a scale from 1 to 5 (5 being very likely), how likely would you consider using or recommending SHARP+ in other climate and resilience-related project or study? *

- 1 (Not likely at all)
- 2
- 3
- 4
- 5 (Very likely)

12. On a scale from 1 to 5 (5 being very much), do you think SHARP has positively contributed to the wellbeing of beneficiaries and their communities? (e.g. through better understanding of livelihoods and drivers of resilience). Select 0 if the question is not applicable. *

- 0 (Not applicable)
- 1 (Not at all)
- 2
- 3
- 4
- 5 (Very much)

13. Based on your experience, which potential improvements the SHARP team should consider enhancing the quality and performance of SHARP+ and its use in the field? (Select only a maximum of three options as "High Priority") *

- Nothing, I am satisfied with the tool / I have nothing else to add
- Reduce the length of the questionnaire without compromising the methodology



- Provide face-to-face training on how to manage and analyse the data gathered
- Make material available on how to manage and analyse the data gathered
- Provide guidance on how to interpret the results based on the analyzed data (i.e. through training or guidance notes)
- Reformulate the technical questions in a way these are more user-friendly
- Reformulate self-assessments (importance and adequacy) to better capture farmers' desires and concerns
- Provide face-to-face guidance to enumerators during the data collection phase (e.g. accompany the enumerators the first days of data collection)
- Provide timely IT support when bugs are reported on the application
- Ensure that the application fulfills all its technical functions before starting field activities (i.e. GPS, data submission, translations)
- Provide guidance on how to share and discuss the results with the communities assessed
- Allow customization of surveys by users
- Other

13b. Please specify which other improvement (This is only applicable if "Other" is selected above)

14. Please write any other comment you would like to give us on your overall experience using SHARP+ or on how we can improve the tool. Thanks.

15. Would you agree to be contacted by the SHARP team to further share your experience and valuable suggestions, if needed? *

- Yes (please make sure to provide your e-mail address in question ii)
- No

Annex F

Training agenda

Day 1	Presenting and understanding the SHARP tool
08.30 – 09.00	Welcome of participants.
09.00 – 09.10	Workshop opening.
09.10 – 09.30	Starting the training: expectations.
09.30 – 10.00	Brainstorming on climate resilience and land management. General presentation of the SHARP+ tool.
10.00 – 10.30	Questions and answers session.
10.30 – 11.00	Coffee/Tea break.
11.30 – 12.30	Individual work: review of the SHARP+ questionnaire.
12.30 – 13.00	SHARP+ questionnaire: discussion and first impressions.
13.00 – 14.00	Lunch break.
14.00 – 15.00	Presentation of the SHARP+ application and explanation on download, update and launch of the application.
15.00 – 16.00	Working groups on the use of the SHARP+ application.
16.00 – 16.15	Coffee/Tea break.
16.15 – 17.30	Working groups on the use of the SHARP application.
17.30	End of Day 1.

Day 2	Working groups on the use of SHARP+
08.30 – 08.45	Feedback from Day 1.
08.45 – 09.45	Working groups on the use of the SHARP+ application.
09.45 – 10.30	Feedback from working groups on the use of the SHARP+ application and discussion on encountered problems.
10.30 – 11.00	Coffee/Tea break.



Day 2	Working groups on the use of SHARP+
11.00-11.30	Facilitation presentation on the SHARP+ tool.
11.30 – 12.00	Working groups: translation of key concepts in local language.
12.00 – 14.00	Lunch break.
14.00 – 14.30	Working groups: translation of key concepts in local language.
14.30 – 15.00	Feedback from translation exercise: difficulties and possible solutions.
15.00 – 16.30	Case study: Testing the application and interpreting the results.
16.30 – 16.45	Coffee/Tea break.
16.45 – 17.15	Feedback.
17.15	End of day 2.

Day 3	Development of individual work plans
9.00 – 12.00	Field visit to test the application.
12.00 – 13.30	Lunch break.
13.30 – 15.00	Feedback on application performance and content.
15.00 – 17.00	Addressing application issues.
17.00	End of Day 3.

Day 4	Development of individual work plans
9.00 – 10.00	Resume: Interpretation of the results and qualitative analysis.
10.00 – 11.30	Selection of project sites (communities).
11.30 – 11.45	Coffee/Tea break.
11.45 – 12.15	Definition of the sample size.
12.15 – 13.15	Preliminary preparation of the work plan: national inception workshops, interview plans, roles and working calendar and qualitative analysis report.
13.15 – 14.30	Lunch break.
14.30 – 15.00	Preliminary preparation of the work plan: national inception workshops, interview plans, roles and working calendar and qualitative analysis report.
15.00 – 15.30	Evaluation and closing of the workshop, and hand-out of training certificates.

Annex G

Terms of reference of enumerators

General description of task(s) and objectives to be achieved

The enumerators will assist the climate resilience expert in the development of the baseline through supporting the design, testing, conducting and reporting of the survey findings. In particular the research associate will:

- participate at the training conducted by the SHARP team;
- assist the SHARP team in the preparation of the survey questionnaire by identifying locally relevant indicators (e.g. lists of crops, trees);
- test the survey questionnaire developed by the SHARP team;
- if applicable, conduct key-informant interviews (the enumerators will be briefed and provided with the lead questions) and assist the SHARP team in conducting focus group discussions with socioeconomic interest groups, including women's and youth groups, at target project sites and prepare synthetic transcripts of the above as well as lists of interviewed stakeholders;
- implement the household survey in project sites by administering the questionnaire to a random sample in the project beneficiary pool up to reaching the selected sample size;
- submit household survey data to the server or send it via mail to the SHARP team;
- in collaboration with the SHARP team, run descriptive analyses of the data and produce relevant figures and graphics; and
- prepare a summary report highlighting the main findings of the key-informant interviews, focus group discussions and household survey, thus providing baseline livelihoods information, gender and vulnerable groups characterization.

Key performance indicators

- Participation at the SHARP+ training workshop.
- SHARP+ survey draft qualitative report.
- SHARP+ survey final qualitative report.



Deliverables

- Finalized household survey questionnaire.
- Household survey data.
- Draft summary qualitative report.
- Final summary qualitative report with sampling and survey methodology and main findings.
- Transcripts of key-informant interviews and focus groups discussions (if applicable).
- Lists of stakeholders interviewed (if applicable).

Required qualifications and experience

- A bachelor's degree or about to graduate in social sciences, natural resources management or any other related fields.
- Knowledge of local language(s).
- Experience in participatory rural appraisal techniques.
- Experience in preparing and conducting household surveys.
- Proven skills in data entering and computing, matrix management and statistical elaborations with Excel.
- Knowledge of local landscapes.

Plant Production and Protection Division (NSP)

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Viale delle Terme di Caracalla

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