



Climate Change Adaptation and Mitigation in Agri-Food Systems

A Compendium of Analytic Tools for Practitioners
Version January 2023

As a federally owned enterprise, GIZ supports the German Government in achieving its objectives in the field of international cooperation for sustainable development.

Published by:
Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Registered offices
Bonn and Eschborn, Germany

Friedrich-Ebert-Allee 36
53113 Bonn Germany
T +49 228 4460-0
F +49 228 44 60-17 66

E info@giz.de
I www.giz.de/en

Responsible:
Sector Network Natural Resources and Rural Development (SNRD) Asia and the Pacific, Task Force on Climate-Smart Agricultural Value Chains – Dr. Sophia Baumert (Task Force Workstream Lead), Dr. Till Ludwig (Task Force Lead)

Design:
Agnes Weegen, Cologne

Photo credits:
Page 1 left above © GIZ/Jörg Böthling, left below © GIZ/Ursula Meissner
center, right above © GIZ/Christoph Mohr, right below © GIZ/Angelika Jakob
Page 6 © CIAT/Georgina Smith
Page 14 © GIZ/Christoph Mohr
Page 21 © CIAT/Neil Palmer
Page 30 © CIAT/Georgina Smith
Page 35 © CIAT/Neil Palmer
Page 39 left, right © CIAT/Georgina Smith, center © GIZ/Felana Rajaonarivelo

URL links:
This publication contains links to websites of other organisations. These links are solely intended to enhance user-friendliness and in no way indicate an approval of the contents provided on any other website. Responsibility for content on these sites rests with the respective provider of that content and GIZ accepts no responsibility for content provided by external organisations.

GIZ is responsible for the content of this publication.

January 2023



Imprint	02
Introduction	04
Acknowledgements	05
Legend of this guide	05
Tools on Climate Risk Assessment	06
The Vulnerability Sourcebook	07
Climate Risk Planning & Management Tool for Development Programmes in Agri-Food Systems (CRISP)	09
Climate Risk Assessment – 6-step CRA methodology	10
Think Hazard!	11
Let's Respond – a guide to integrating climate change risks and opportunities in rural and regional development	12
Self-evaluation and Holistic Assessment of Climate Resilience of Farmers and Pastoralists (SHARP)	13
Tools for Greenhouse Gas Assessment	14
The Ex-Ante Carbon Balance (EX-ACT) suite of tools	15
Global Livestock Environmental Assessment Model (GLEAM-i)	17
The Mitigation Options Tool (CCAFS-MOT)	18
Sustainable Agricultural Land Management (SALM) Tool	19
Cool Farm Tool	20
Tools for Climate Action	21
Climate Proofing Tool	22
ValueLinks	23
Climate Finance Training for Sector Experts (CliFit4SE)	24
Participatory Integrated Climate Services for Agriculture (PICSA) and Digital PICSA (E-PICSA)	25
Rapid Loss Appraisal Tool (RLAT)	27
Toolbox on Solar Powered Irrigation Systems (SPIS)	28
Climate Expert	29
Information Tools / Web-Portals	31
Climate Risk Country Profiles	32
AGRICA – Climate risk analyses for adaptation planning in sub-Saharan Africa	33
Climate Action Tracker (CAT)	34
Searching Machines for relevant Tools	35
Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA) Learning Zone	36
Climate Toolbox – NDC Partnership	37
Climate Risk Assessment Method Search Engine (CRAMSE)	38

Developing and emerging countries are suffering from the impacts of climate change. Extreme weather events, such as droughts and floods, threaten yields and the survival of millions of people. Climate impacts jeopardize development gains already made under the 2030 Agenda. While agriculture on the one side has to meet the demand for food in the context of a growing world population, on the other hand roughly 42 per cent of global GHG are associated with food systems, including food production, land use change, agricultural supply chains and food loss and waste. About 90 per cent of global deforestation is caused by the conversion of forests into agricultural land.

Increasing climate variability and extremes are putting agri-food systems and rural areas at risk, undermining the sustainability of agriculture-based livelihoods and sustainable rural development. Climate change adaptation and mitigation measures (climate action) have therefore become a major element in agricultural and rural development planning worldwide.

Climate change has a strong impact on all sectors and activities of rural development projects and agri-food systems; agri-food systems encompass primary agricultural production of food and non-food products, the food supply chain from producer to consumer and the final consumer of food. The climate impacts, however, vary by country, by production system, by stage of the value chain and other social, political and environmental dimensions of national agri-food systems. Therefore, targeted mitigation and adaptation approaches are required.

Why this Compendium?

Numerous tools have been developed and continue to be developed to integrate climate change aspects into agricultural and rural development projects. There is no dearth of tools on climate change adaptation and mitigation in the agricultural and rural development area. Broad internet searches lead to numerous results.

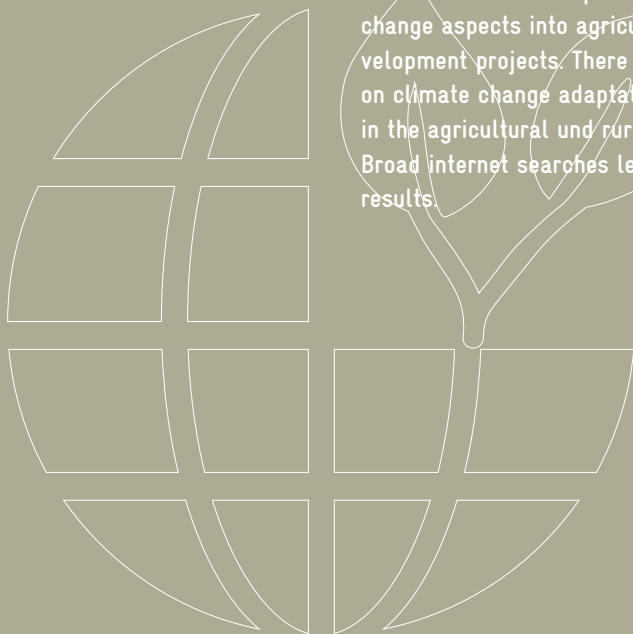
However, they differ in level and complexity of application, methodology, in quality and target group. As a result, it becomes increasingly difficult for users to find and to place each tool in the appropriate context.

Here, the compendium comes in, giving an overview of the most relevant tools that can be applied in an agricultural context, and providing further information for in-depth studies and research. The compendium considers tools that can be applied at different stages of adaptation planning from high-level identification of key vulnerabilities to more in-depth analysis of particular vulnerabilities, as well as for the development of concrete adaptation measures or strategies and monitoring and evaluation of adaptation interventions.

What is this Compendium for?

The Compendium should be of particular interest to development experts looking for an effective tool which can:

- Help the user to assess the climate risks for rural development and agri-food systems and identify ‘hotspots’ that need particular attention.
- Help the user to better understand and quantify the emissions that a specific agri-food system or value chain produces, and thereof derive mitigation measures.
- Help the user to improve adaptation planning, to enhance the development and implementation of adaptation measures and to support M&E of adaptation activities. Provide information which are useful for general learning as well as providing important data resources.
- Support in-depth search for other specific tools.



Acknowledgements



The Compendium is a comprehensive resource that has been developed by the Task Force on Climate-Smart Agricultural Value Chains of the SNRD Asia and the Pacific. The Task Force, which focuses on implementing climate-sensitive approaches, has prepared a variety of products to support the implementation of projects related to agricultural value chains. Along with the Compendium, the Task Force has also created a database of effective measures for addressing climate change in agricultural value chains, as well as an upgraded version of the ValueLinks 2.0 Methodology that incorporates climate-relevant considerations.

We would like to extend our sincere gratitude to Gertraud Faltermeier, Johannes Peters, Marlen Trolp, Fernando Camargo, Alfons Eiligmann and many other individuals who have provided valuable support in the development and publication of this work.

Legend of this guide

Developed by	>	Who developed the tool?
Exists since	>	Since when does the tool exist? (When has it been updated?)
Scope of application	>	What is this tool used for? At which stage of project cycle?
Objective	>	What does this tool aim at?
Outputs	>	What is provided by the tool?
Short description	>	In this section, a short summary of the tool's features is given.
How to be used	>	In this section, a short description of how the tool is to be used is provided.
Format	>	Format of the tool can be: Excel sheet/ (interactive) website/ pdf document/ desktop application/ web portal/etc.
Main users	>	Who are the users the tool is addressed to?
Language	>	Specification of all available languages.
Time requirement	>	Estimated time needed to implement the tool is provided.
Difficulty	>	Simple: the tool is easy to use and there is no specific knowledge needed beforehand. Medium: users need to have some basic knowledge before using the tool. Professional: in-depth knowledge is required to make use of the tool.
Links	>	A direct link to access the tool/ the corresponding website is provided.
Contact	>	Links for contact: e-mail addresses or contact sheets.
Comments	>	What else should be said about the tool?

Tools on Climate Risk Assessment





Developed by	> Published by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) in cooperation with adelphi and Eurac Research (Donor Federal Ministry for Economic Cooperation and Development (BMZ))
Exists since	> 2014, Risk Supplement added 2017 Will be replaced by „Climate Risk Sourcebook “(approx. In March 2023); main aim of the new Climate Risk Sourcebook is to support adaptation and risk management practitioners with state-of-the-art guidelines for climate vulnerability and climate risk assessments, including a digitized, easily accessible, user-friendly, and demand-driven version of the Climate Risk Sourcebook.
Scope of application	> Vulnerability assessment; different stages of adaptation planning and development of adaptation measures; setting up of monitoring and evaluation systems for adaptation measures.
Objective	> The Vulnerability Sourcebook offers a methodology for the assessment of the vulnerability to climate change, for the development and implementation of measures to address the vulnerabilities, and finally for setting up a monitoring system in order to review effectiveness of adaptation measures. The scope for using vulnerability assessments is extremely broad; it is site and context-specific and ranges from developing adaptation measures in rural communities to preparing National Adaptation Plans.
Outputs	> <ul style="list-style-type: none"> ■ Basis to identify adaptation options. ■ Better understanding about climate risks and impacts. ■ Better risk management for sustainable economic development. ■ Improvement of adaptation in development planning. ■ Support for monitoring and evaluation of adaptation. ■ Provision of detailed information and enable learning about vulnerability, indicators, impact chains and data management.
Short description	> <p>The Vulnerability Sourcebook provides recommendations on how to assess climate risks and vulnerabilities and reduce and/ or address them through planning in the context of climate change.</p> <p>The VA Sourcebook is a step-by-step guide on how to conduct Climate Risk and vulnerability assessments. It explains the process of a vulnerability assessment and facilitates detailed learning about important aspects such as indicators, impact chains and data management.</p> <p>The guide covers the entire life cycle of adaptation interventions, using consistent methods verified on the ground. The guide uses the full spectrum of possible adaptation measures, plans and strategies and supplements these with project examples.</p> <p>The chapter ‘presenting the outcomes of vulnerability assessments’ is very informative and offers various presentation methods to the user. The sourcebook’s annex provides useful additional information and assessment templates to be used.</p>
How to be used	> <p>The user needs to follow the detailed descriptive modules during the assessment. The modules cover sequential topics:</p> <ol style="list-style-type: none"> 1. Preparing the vulnerability assessment 2. Developing climate impact chains 3. Identifying and selecting indicators 4. Data acquisition and management 5. Normalization of indicator data 6. Weighting and aggregating of indicators 7. Aggregating vulnerability components to vulnerability 8. Presenting the outcomes of your vulnerability assessment <p>The topic of each module is introduced, and the procedure is explained in detail. The modules build upon each other and can hardly be used separately.</p>
Format	> pdf document with modules on sheets



Main users	>	<ul style="list-style-type: none">■ Adaptation and risk management practitioners who commission, conduct or update vulnerability and risk assessments■ Experts involved in the technical backstopping of climate risk assessments■ Technical and adaptation experts looking for an effective vulnerability assessment tool at various spatial and administrative levels.■ Readers tasked with overall vulnerability assessment coordination that require a more profound understanding of the concepts behind vulnerability analyses.
Language	>	English, French, Spanish
Time requirement	>	There are 8 different modules and the time required for implementation of the different modules depends on different factors (e.g. availability of data); it is therefore difficult to make a generally valid statement on required time.
Difficulty	>	Medium
Links	>	<u>Vulnerability Sourcebook</u> <u>Risk Supplement</u> <u>Climate Risk Assessment for Ecosystem-based Adaptation</u> <u>The vulnerability sourcebook and climate impact chains</u>
Contact	>	<u>climate@giz.de</u>
Comments	>	A very detailed and complex guidance which allows users to immerse into the topic. Project staff aiming to apply the guidance need to properly understand the procedure or the vulnerability process needs to be moderated.

Climate Risk Planning & Management Tool

for Development Programmes in Agri-Food Systems (CRISP)



Developed by	>	<ul style="list-style-type: none">■ Developed by a partnership of:<ul style="list-style-type: none">■ The Alliance of Bioversity International & International Centre for Tropical Agriculture (CIAT)■ Eurac Research – funded by the Federal Ministry for Economic Cooperation and Development (BMZ).■ GIZ with funding from Federal Ministry for Economic Cooperation and Development (BMZ).
Exists since	>	Under development – Launch planned for 2023
Scope of application	>	Initial stage of adaptation planning.
Objective	>	<p>The CRISP Tool permits agricultural and rural development projects</p> <ul style="list-style-type: none">■ to conduct an initial, simple and quick exploration of climate implications■ uses the concept of standardized impact chains to understand the relevant climate risks for agriculture in the context of a given project■ helps to ensure appropriate integration of climate risks in designing and implementing agricultural and rural development programs■ assists to identify starting points for climate risk management■ assists to articulate and evaluate adaptation hypotheses that can be tested in the project context■ provides knowledge and resources
Outputs	>	Description of climate hazards, impacts, hazard-impact- links, vulnerabilities and adaptation options in the context of a given project. Furthermore, provision of links and resources for in depth studies.
Short description	>	CRISP performs an initial, simple and quick exploration regarding climate impacts on a project, based on the "impact chains" methodology developed in the Vulnerability Sourcebook.
How to be used	>	CRISP is a simple, interactive web-based tool. The user simply fills out the project specific criteria such as macroregion; country(ies); development outcome; farming system; scale of intervention; commodities; target beneficiaries and agroecological zone. The tool then uses the concept of impact chains based on the Intergovernmental Panel on Climate Change (IPCC) risk framework to generate a user-friendly output.
Format	>	Interactive web-based tool
Main users	>	Agricultural and rural development project planners and managers.
Language	>	English, potentially French
Time requirement	>	The web-based tool is easy to understand and can be applied within few hours; the results can be used for the subsequent development of the impact chains and project planning.
Difficulty	>	Simple
Links	>	Flyer
Contact	>	Sector project rural development Ingrid.Prehm@giz.de
Comments	>	CRISP does not provide an in-depth analytical, quantitative risk analysis or comprehensive climate risk assessment, delivers only initial, simple and quick exploration of climate risks.

Climate Risk Assessment (CRA) – 6-step CRA methodology



Developed by	> Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) in collaboration with the International Institute for Applied Systems Analysis (IIASA) and other partners
Exists since	> 2021
Scope of application	> Comprehensive climate risk assessment; different stages of adaptation planning, development of adaptation measures.
Objective	> <ul style="list-style-type: none"> ■ CRA aims to identify risk, assess the magnitude of impacts on people, value chains, (critical) infrastructure, assets and ecosystems, and ascertain the possible options for action. ■ Support evidence-based and risk-informed decision making and planning in the context of climate change. ■ The methodology aims at identifying a smart mix of CRM options. These consider environmental, social, economic, institutional, and cultural aspects, and also target interdependencies between slow onset processes and extreme weather events. ■ Instead of applying individual and stand-alone measures, the framework involves a combination of proven and innovative instruments. It comprises measures related to mitigation, adaptation, and disaster risk management as well as risk finance and insurance and further transformational, innovative measures to manage current and future climate risks.
Outputs	> <ul style="list-style-type: none"> ■ Evaluation of Risk tolerance ■ Identification of feasible options to avert, minimize and address (potential) losses and damages
Short description	> <p>CRA builds the foundation for effective Climate Risk Management (CRM). The 6-step CRA methodology developed by the Global Program on Risk Assessment and Management for Adaptation to Climate Change (Loss & Damage) provides practitioners and decision-makers with a guidance on how to assess climate risks and how to translate the assessment into measures.</p> <ol style="list-style-type: none"> 1. Analysis of status quo – information needs and objectives 2. Hotspot and capacity analysis of system of interest 3. Development of a context-specific methodological approach 4. Qualitative and quantitative risk assessment 5. Evaluation of risk tolerance 6. Identification of feasible options to avert, minimise and address (potential) losses and damages <p>Main characteristics of the methodology include the participation of all stakeholders, the assessment of hazards along the entire spectrum from slow onset processes to extreme weather events, the consideration of non-economic losses and damages as well as the focus on risk tolerance levels. It aims at identifying a smart mix of climate risk management measures, combining proven instruments from climate change adaptation and disaster risk management with innovative measures to address residual risks which cannot be averted.</p>
How to be used	> Following the 6-step guidance
Format	> pdf Document
Main users	> Practitioners and decision-makers
Language	> English
Time requirement	> The implementation is done in 6 steps and takes in total several weeks to months depending on the initial situation.
Difficulty	> Medium
Links	> Document
Contact	> Dr. Michael Siebert michael.siebert@giz.de ; GIZ Global Programme on Risk Assessment and Management for Adaptation to Climate Change (Loss and Damage) (GP L & D)
Comments	> Contrary to other CRA methods, the methodology accounts for interdependencies of risks, prioritizes adaptation options, and considers limits of adaptation.

Think Hazard!



Developed by	> Global Facility for Disaster Reduction and Recovery (GFDRR)
Exists since	> 2015
Scope of application	> Initial phase of risk assessment/ adaptation planning, development of measures for risk reduction.
Objective	> Identification of natural hazards affecting project areas, provision of guidance on how to reduce the impact of these hazards, and where to find more information.
Outputs	> <ul style="list-style-type: none"> ■ Hazard analysis under current climate conditions ■ Guidance from Intergovernmental Panel on Climate Change (IPCC) on how climate change may alter hazard frequency and intensity into the future
Short description	> <p>Think Hazard! is a simple and quick, yet robust, analytical tool that enables development specialists to determine for a given project location the potential likelihood of 11 natural hazards, and what actions they should take to make their project resilient.</p> <p>Hazard types:</p> <ol style="list-style-type: none"> 1. Geophysical hazards: Earthquakes, Tsunami, Volcanic eruption 2. Hydraulic hazards: Floods, Landslides, Coastal floods 3. Meteo-climatological hazards: cyclonic strong winds, water scarcity, extreme temperature, wildfires <p>Think Hazard! is a simple flagging system to highlight the hazards present in a project area. As such, a user is only required to enter their project location – national, provincial or district name. The results interface shows a user whether they require high, medium or low awareness of each hazard when planning their project.</p> <p>It also provides recommendations and guidance on how to reduce the risk from each hazard within the project area and provides links to additional resources such as country risk assessments, best practice guidance, additional websites. Think Hazard! also highlights how each hazard may change in the future as a result of climate change.</p>
How to be used	> Begin typing your location of interest (country name, region or district) and select the correct location from the drop-down. Hit enter, and you will be taken to the overview of hazards for that location. From there, you can view more detail on any of the hazards (including guidance on reducing risk, useful resources and contacts), and you can navigate to more specific and neighboring locations using the map.
Format	> Interactive website
Main users	> Development sector professionals
Language	> English, French, Spanish
Time requirement	> Less than one hour
Difficulty	> Simple
Links	> <p>Tool Methodology Methodology Report Version 2</p>
Contact	>
Comments	> The tool is limited to the identification of hazards and first ideas how to address the hazards; it is not suitable for a comprehensive climate risk assessment.

Let's Respond – a guide to integrating climate change risks

and opportunities in rural and regional development



Developed by	> <ul style="list-style-type: none"> ■ Department of Cooperative Governance, South Africa ■ Department of Environmental Affairs, South Africa ■ Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH ■ South African Local Government Association
Exists since	> 2012, regular updates on website
Scope of application	> Climate Mainstreaming in rural and regional development planning processes.
Objective	> To assist development planners at the local government level to integrate climate response strategies into local systems and structures.
Outputs	> Climate sensitive local development plans.
Short description	> <p>The Let's Respond Toolkit was originally developed to assist South African municipal governments and project developers in integrating climate change risks and opportunities into municipal planning. To translate National Determined Contribution (NDC) goals into action, both national and sub-national adaptation plans are necessary.</p> <p>This guide provides a simple, five-phase process (1. Preparation 2. Analysis 3. Strategy 4. Projects 5. Integration Implementation) aligned with the municipalities' development planning approaches. Each phase includes steps that will ensure the integration of climate response strategy into decentralized governments systems and structures. The steps are accompanied by support tools or resources, found in the toolkit, which will facilitate each process.</p>
How to be used	> <p>The guide is designed to take municipal planners (possibly together with project planners) through the necessary steps towards designing climate responsive development.</p> <p>Each chapter is introduced by showing the user a clear structure explaining the objective, the timeframe, when to use the chapter and the expected outcome of each chapter. The various tools which are to be applied in each chapter are also listed on the introductory page.</p> <p>Each chapter ends with a concluding part and a reference.</p> <p>Further the website provides information about climate change related topics in South Africa and training courses on climate finance.</p>
Format	> pdf document with reference links and interactive website.
Main users	> <ul style="list-style-type: none"> ■ Planning bodies at decentralized level (regional to local). ■ Project planners and implementers.
Language	> English
Time requirement	> <p>Each step requires approximately 1-2 months.</p> <p>The complete planning process therefore requires 5-10 months.</p>
Difficulty	> Medium - Professional
Links	> <p>Website Guide Toolkit all tools PowerPoint</p>
Contact	> Contact form
Comments	> Clearly structured planning guide interspersed with useful tips and references. Developed for planning process in South Africa.

Self-evaluation and Holistic Assessment of Climate Resilience of Farmers and Pastoralists (SHARP)



Developed by	> Food and Agriculture Organization of the United Nations (FAO) The tool was developed in partnership with the University of Leeds following a thorough review of the existing climate resilience literature and resilience.
Exists since	> 2012, latest update 2022
Scope of application	> Evaluation of farmers' climate resilience and identification of major bottlenecks of farmers' climate resilience; useful instrument for baseline and endline surveys of development projects.
Objective	> To identify areas of weak resilience and providing a baseline upon which changes can be made.
Outputs	> Situation analysis as a foundation for intervention planning in rural development.
Short description	> SHARP+ is a customizable digital survey using a tablet-based application. It is both a learning tool as well as a monitoring and evaluation (M&E) tool for climate resilience. In synergy with a number of partners, SHARP supports projects in improving the resilience of farmers and herders as to safeguard their way of life, preserve their local indigenous knowledge and improve the livelihoods of their communities. Based on Cabell and Oelofse (2012) 13 agroecosystem's resilience indicators , the SHARP+ tool is a holistic assessment of farmers climate resilience at the household level. The application automatically generates a report containing a preliminary analysis of collected data and offers the possibility of a real time comparison of the assessment score. The tool highlights the best or worst components of the farming or pastoral system in terms of climate resilience in order to feed discussions while in the field.
How to be used	> The tool can be used directly, allowing the questionnaire to be completed without an internet connection. The survey includes questions related to critical aspects of the household and farm system covering environment, social, agricultural practices, economic and governance factors as to assess in an integrated manner all aspects of the farm/ pastoral system using a holistic approach. For each module, two types of questions are asked: 1) the technical component 2) the self-assessed adequacy component. 3 Phases: Following a survey-based evaluation of households' climate resilience (Phase 1), gaps and weaknesses in the response of farmers and institutions to climate variability are analysed (Phase 2). The information gathered through the first two phases is integrated with broader-level climatic data, with the aim of assisting farmers in prioritising actions to increase the resilience of their agro-ecosystems – as well as orienting institutions towards the best possible policy approaches in order to strengthen climate resilience (Phase 3).
Format	> Survey application for computer, tablet or android smartphone
Main users	> Project planners and implementers at micro and meso level.
Language	> Latest version: English, French and Turkish
Time requirement	> The time required for the participatory assessments varies according to context. SHARP+ standard survey consists of 33 modules.
Difficulty	> Medium - Professional
Links	> Website Information
Contact	> SHARP@fao.org
Comments	> SHARP uses a very comprehensive questionnaire to assess farmers' climate resilience. Indicators to measure farmers' resilience are linked to agroecologic concept. Questionnaires include modules on forest management, livestock housing and health, fish production, food insecurity experience scale (FIES), involuntary resettlement and displacement, housing and sanitation practices.

A photograph of a group of women in a community meeting, overlaid with a green tint. The women are gathered around a table, looking at and discussing various documents and papers. One woman in the foreground is wearing a patterned headscarf and a patterned dress. Another woman in the background is wearing a white shirt and a patterned headscarf. The scene suggests a collaborative learning or assessment session.

Tools for Greenhouse Gas Assessment

The Ex-Ante Carbon Balance (EX-ACT) suite of tools



Developed by	> Food and Agriculture Organization of the United Nations (FAO)
Exists since	> 2010, Latest Version: 9.3 (2022)
Scope of application	> EX-ACT suite of tools can be used at any stage of the intervention – the design (ex-ante), monitoring and evaluation (ex-post) of projects and policies.
Objective	> <ol style="list-style-type: none"> 1. The EX-Ante Carbon-balance Tool (EX-ACT) can help prioritize project activities on the basis of their carbon balance. It can support policymakers in integrating climate change mitigation objectives into national policies and international commitments. 2. EX-ACT for value chains (EX-ACT VC) aims to support policymakers and development practitioners to identify greenhouse gas (GHG) emission mitigation potential along an agri-food value chain. 3. Biodiversity Integrated Assessment and Computation Tool (B-INTACT) helps decision-makers making informed decisions on the basis of thorough biodiversity assessment.
Outputs	> <ol style="list-style-type: none"> 1. EX-ACT: <ul style="list-style-type: none"> ■ Estimation of the GHG impact of projects and programs. ■ Prioritization of project activities with high benefits in economic and climate change mitigation terms. ■ Economic project analyses for subsequent proposals to climate funds (Green Climate Fund, Adaptation Fund). 2. EX-ACT VC calculates GHG emissions throughout the value chain analyzed, covering all production phases from processing, storage, packaging, to transportation at the retailer-door. It also allows for the accounting of emissions at production level, when derived from other tools (e.g. EX-ACT) 3. B-INTACT: <ul style="list-style-type: none"> ■ Quantification of biodiversity impact of various investments at project and policy-level ■ decision-makers with a set of policy indicators to help making informed decisions
Short description	> <p>EX-ACT is a suite of tools:</p> <ol style="list-style-type: none"> 1. Ex-Ante Carbon-balance Tool (EX-ACT) – the below described tool that was developed first – quantifies the amount of greenhouse gas released or sequestered from agricultural production. The carbon-balance is defined as the net balance from all greenhouse gases (GHG) expressed in Carbon dioxide (CO₂) equivalents that were emitted or sequestered during project implementation as compared to a business-as-usual scenario. EX-ACT is a land-based accounting system, estimating carbon stock changes (i.e., emissions or sinks of CO₂) as well as GHG emissions per unit of land, expressed in tons of CO₂ equivalents per hectare and year. 2. EX-Ante Carbon-balance Tool for value chains (EX-ACT VC) analyses the effects of interventions along the agricultural value chains from processing, storage, packaging, to transportation at the retailer-door. It supports policy makers in identifying off-farm sources of greenhouse gas (GHG) emissions and farm-to-retail socio-economic benefits when designing projects and policies for low carbon value chains. 3. Biodiversity Integrated Assessment and Computation Tool B-INTACT looks at the biodiversity impacts of agricultural activities.
How to be used	> <p>A detailed description and technical guidelines are available at: Link</p> <p>In the main tool – EX-ACT, various user inputs on (1) Land use change, (2) Cropland management, (3) Grassland and livestock, (4) Forest degradation and management, (5) Inland wetlands (6) coastal wetlands (7) fisheries and aquaculture, and (8) inputs and investments lead to a detailed specification of the carbon balance from project activities.</p>
Format	> Excel (xlsx) based. To be downloaded.
Main users	> Project and program planners



Language	> All United Nations (UN) languages as well as German, Bahasa Indonesia, Vietnamese Version 9 is available in English only.
Time requirement	> 1 week, depending on the availability of input data (for example: livestock numbers, feeding practices, types of vegetation) which may not be readily available in all project/ programs.
Difficulty	> The tool requires basic knowledge of agriculture and forestry as well as production processes.
Links	> Website Download tool
Contact	> EX-ACT@fao.org
Comments	> EX-ACT e-learning and training workshops available

Global Livestock Environmental Assessment Model (GLEAM-i)



Developed by	> Food and Agriculture Organization of the United Nations (FAO)
Exists since	> 2016, Latest Version: GLEAM-i 2.0 (2018)
Scope of application	> Ex-ante Assessment of mitigation potential, evaluation of mitigation measures.
Objective	> <ul style="list-style-type: none"> ■ Quantification of greenhouse gas emissions from livestock sector activities. ■ Ex-ante project evaluation for the assessment of intervention scenarios in animal husbandry, feed and manure management.
Outputs	> <p>GLEAM produces the outputs in aggregated totals and in Geoinformation system (GIS) format. A complete simulation of GLEAM produces multiple outputs which can be either final indicators and maps or intermediate calculations for subsequent planning operations:</p> <ul style="list-style-type: none"> ■ Livestock numbers and their spatial distribution. ■ Manure production and management. ■ Animal feed rations' composition and quality. ■ Livestock commodities production. ■ Emissions arising from each stage of the production process.
Short description	> <p>GLEAM-i is an open, interactive and livestock specific tool designed to support governments, project planners, producers, industry and civil society organizations to calculate greenhouse gas emissions.</p> <p>GLEAM is a modelling framework that simulates the environmental impacts of the livestock sector. It represents and calculates the bio-physical processes and activities along livestock production chains under a life cycle assessment approach. GLEAM identifies three main groups of emissions:</p> <ul style="list-style-type: none"> ■ Upstream emissions include those related to feed production, processing and transportation. ■ Animal production emissions comprise emissions from enteric fermentation, manure management and on-farm energy use. ■ Downstream emissions are caused by processing and post-farm transport of livestock commodities.
How to be used	> <p>Initially, users need to fill out various formats for the three overall modules (1) herd, (2) feed and (3) manure.</p> <p>Animal production data and the total greenhouse gas (GHG) emissions calculated are shown in numerical form and as tables or figures. It is important to notice that emission intensities and emission sources, important for prioritizing mitigation measures, can also be displayed.</p>
Format	> Online simulator (on Excel basis)
Main users	> Key stakeholders within the livestock sector (producers, policymakers, private sector organizations, academia, standard setting bodies and non-governmental organizations).
Language	> English
Time requirement	> 3-4 hours if all required data are available. (However, experiences show that required data are often incomplete).
Difficulty	> Medium – Professional
Links	> Website Tool Guidelines
Contact	> Info-GLEAM@fao.org
Comments	> Future versions of GLEAM will also include modules on carbon sequestration, nutrient and water use and interactions with biodiversity. It will also include procedures for the estimation of the impact of feed quality on animal performances.

The Mitigation Options Tool (CCAFS-MOT)



Developed by	>	<ul style="list-style-type: none"> ■ Research Program on Climate Change, Agriculture and Food Security (CCAFS) ■ The University of Aberdeen
Exists since	>	2013, Latest update October 2018
Scope of application	>	Rapid assessment of mitigation potential, prioritisation of mitigation measures. Production stage of value chain.
Objective	>	Contribute to an improvement of agricultural planning and operations in terms of greenhouse gas (GHG) mitigation.
Outputs	>	<ul style="list-style-type: none"> ■ Fast, accessible comparison of mitigation options for agriculture with minimal training or data requirements. ■ Prioritization of low-emissions initiatives in a variety of agricultural contexts.
Short description	>	<p>CCAFS-MOT is a self-explanatory decision-support tool for policy advisors and extension services.</p> <p>The CCAFS-MOT estimates GHG emissions from various crops, crop groups and livestock production in different regions. By bringing together several different empirical models to estimate GHG emissions, CCAFS-MOT provides policymakers across the globe with the reliable information needed to make informed decisions about emission reductions within agriculture.</p> <p>The tool ranks the most effective mitigation options for 34 different crops according to their mitigation potential, in relation to current management practices and climate and soil characteristics.</p> <p>The tool suggests mitigation options that are well suited for the production system, soils and climatic conditions of a farm or project. The suggestions are based on empirical models and data from over a dozen different research studies. This is why the tool has low initial data input requirement.</p>
How to be used	>	It has various excel sheets for calculating emissions from agriculture and livestock operations. The result suggests various possible mitigation measures.
Format	>	Excel (xlsx) based. To be downloaded.
Main users	>	Policy advisors and extension services.
Language	>	English
Time requirement	>	1-2 hours depending on the availability of all input data.
Difficulty	>	Medium: Users need basic knowledge to fill the assessment forms.
Links	>	Tool
Contact	>	Project Leader: Diana Feliciano (diana.feliciano@abdn.ac.uk) ccafs@cgiar.org
Comments	>	The tool appears to be regularly tested with a variety of stakeholders. The developers collaborate with other researchers to ensure that the tool provides decision-makers with updated, accurate, relevant, and easy-to-use information.

Sustainable Agricultural Land Management (SALM) Tool



Developed by	> <ul style="list-style-type: none"> ■ Vi Agroforestry project in partnership with: <ul style="list-style-type: none"> ■ World Bank's Bio-Carbon Fund ■ UNIQUE land use.
Exists since	> 2011, Latest Update 2019
Scope of application	> Monitoring soil and biomass carbon sequestration.
Objective	> To enable farmers to benefit from carbon credits after implementing sustainable agriculture land management practices to store more carbon in the soil.
Outputs	> <ul style="list-style-type: none"> ■ Enables smallholder famers and extension service provider to track and improve farm production ■ Allows monitoring of soil and biomass carbon sequestration consistent with the Verified Carbon Standard
Short description	> The tool provides an activity monitoring system for SALM practices that enables smallholder famers and extension service provider to track and improve farm production. Based on the development of a carbon accounting methodology this system, in combination with a carbon model, is monitoring soil and biomass carbon sequestration consistent with the Verified Carbon Standard. The related demonstration project was validated and twice verified by an international independent auditor demonstrating not only the success, but also the robustness of the approach. The system is considered by the World Bank as the most advanced smallholder agricultural monitoring system in Africa.
How to be used	> The project description together with the carbon methodology and the lessons learned publication provides the building blocks to develop an extension impact and carbon monitoring system. When the purpose of the project is to monitor, extension impacts related to agricultural production only, the carbon methodology specific part can be dropped.
Format	> Paper-free field data collection. Application (App) and database can be provided for the specific project context by UNIQUE forestry and land use (see contact below).
Main users	> <ul style="list-style-type: none"> ■ Public and civil society organizations ■ Project planners ■ Policy advisors
Language	> English
Time requirement	> 12 months to establish the baseline and validate the project assuming an extension organization is in place.
Difficulty	> Professional
Links	> App and database need to be requested. Overview of UNIQUE landuse digital tools
Contact	> tim.tennigkeit@unique-landuse.de Peter.Wachira@viagroforestry.org
Comments	> App and database need to be requested. The link provided demonstrate a successful smallholder agricultural extension approach in combination with an approved carbon accounting methodology: Kenya Agriculture Carbon Project

Cool Farm Tool (CFT)



Developed by	> Cool Farm Alliance: <ul style="list-style-type: none"> ■ Sustainable Food Lab ■ University of Aberdeen ■ Unilever and others
Exists since	> 2008, Latest update 2022 (version 1.1.0)
Scope of application	> Calculation of GHG emission, assessment of emission hotspots and mitigation measures.
Objective	> <ul style="list-style-type: none"> ■ To motivate actions to mitigate greenhouse gas (GHG) emissions, support biodiversity and assess water consumption at scale in global supply chains. ■ To help track, encourage and reward good practice and improvement over time.
Outputs	> <ul style="list-style-type: none"> ■ Carbon emissions per ton and per unit of land from different GHG emissions sources on the farm. ■ Scores for biodiversity in four categories and separately for nine different species groups. ■ Water footprint, water requirements and soil water balance.
Short description	> <p>CFT was designed to bring the complex science of agriculture and climate change to the field. It identifies emission hotspots and makes it easy for farmers to test alternative management scenarios.</p> <p>CFT first focused on farm-level GHG emissions but has since expanded. A biodiversity module is now available in the Temperate Forest biome and the Mediterranean and Semi-Arid biomes. Also, the first phase of water metrics will be available for most crops globally by fall 2016.</p> <p>CFT was developed for buyers and suppliers in agricultural supply chains to perform gap analyses and co-develop pragmatic pathways to improve sustainable agriculture.</p> <p>The web tool is based on an Excel model originally created by the University of Aberdeen in partnership with Unilever and the Sustainable Food Lab. It is based on different empirical and physical models as well as life cycle assessment databases.</p> <p>Biodiversity is based on the CLM yardstick, which is a practice-based assessment that is now undergirded with evidence-based scoring for practices that positively impact biodiversity.</p> <p>The water tool combines the FA056 approach with global soil and climate data. The tool considers different irrigation options.</p>
How to be used	> The user is guided through different tabs of a questionnaire. After every tab the user can save the input. Live results are shown and updated in response to user input for carbon next to the questions.
Format	> Web Portal (older Excel version still available), registration necessary
Main users	> <ul style="list-style-type: none"> ■ Farmers ■ Consumer goods companies and Retailers ■ Agronomists ■ Consultants
Language	> English
Time requirement	> 20 minutes for carbon, biodiversity or water
Difficulty	> Simple
Links	> The Cool Farm Tool
Contact	> info@coolfarmtool.org
Comments	> It was initiated as a collaboration between academic and industry partners as an excel spreadsheet in 2008, before it was released as an online tool in 2012. The tool is multi-metric. It has been used for thousands of assessments to this date. The tool is managed by the Cool Farm Alliance and is being constantly improved to meet user demands.

A man wearing a wide-brimmed straw hat and a light-colored button-down shirt is shown in profile, looking down at a bunch of white beans hanging from a plant. The entire image is overlaid with a semi-transparent yellow filter. In the top left corner, there is a small yellow square followed by a black-bordered box containing the text "Tools on Climate Action".

Tools on Climate Action

Climate Proofing Tool



Developed by	<ul style="list-style-type: none"> ■ Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) ■ On behalf of Federal Ministry for Economic Cooperation and Development (BMZ), Germany ■ Organisation für wirtschaftliche Zusammenarbeit und Entwicklung (OECD)
Exists since	2010, Latest update 2016
Scope of application	Project planning: Assessment of climate risks and integration of adaptation measures in project planning.
Objective	<ul style="list-style-type: none"> ■ To enhance capacities among development actors and to support institutions in successfully taking action on climate change adaptation. ■ To support the integration of climate change impacts as well as awareness of the challenges and opportunities of climate change in development planning on various levels. ■ The aim of the systematic approach used in the Climate Proofing Tool is to increase the chances of success of planned and implemented value chains and activities.
Outputs	The Climate Proofing Tool users obtain a list of possible adaptation options to climate change and which of them are feasible for the value chain/activity.
Short description	The Climate Proofing Tool consists of a series of training steps towards adaptation planning. The training can be implemented in small groups. Each group will focus on a particular case study or system of interest – an agricultural system or value chain. Pre-defined case studies form the basis of applying the climate proofing tool. The selection of the case studies will have been done in advance by the program implementing the training or by the participants themselves, or both. The case studies have been prepared with details on existing climate conditions, systems characterization including biophysical, as well as socioeconomic aspects.
How to be used	<p>The Climate Proofing Tool consists of 3 steps:</p> <ol style="list-style-type: none"> 1. Assessing the current and future climate risks 2. Identifying adaptation options 3. Selecting adaptation measures <p>The manual guides through the 3 steps with their several tasks and questions.</p>
Format	pdf document manual
Main users	<ul style="list-style-type: none"> ■ Planners and policy makers ■ National implementing entities
Language	English
Time requirement	<p>Implementation of Climate Proofing Tool (assessment of climate risks and integration of adaptation measures in planning) takes 2 days.</p> <p>Upstream training to build capacity of trainers for Climate Proofing Tool (implementation of practice oriented training for planners and national implementing entities) takes 4–5 days.</p>
Difficulty	Simple and easy to understand
Links	<p>Climate Proofing Tool Upstream training for capacity building for practitioners</p> <p>Integrating climate change adaptation into development planning. A practice-oriented training based on an OECD Policy Guidance. Handouts.</p>
Contact	climate@giz.de
Comments	The upstream training helps to strengthen capacities of implementing entities in climate change adaptation measures and builds capacities to implement Climate Proofing Tool.



Developed by	> Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
Exists since	> 2008 (first edition)
Scope of application	> ValueLinks provides a framework for value chain analysis and project planning related to different sectors, value chains and agri-food systems.
Objective	> To equip users with a comprehensive methodology for economic, social and environmental analysis and participatory planning of sustainable solutions.
Outputs	> Users become familiar with specific analytical tools and development options.
Short description	<p>> The new edition of 2018 (ValueLinks 2.0) consists of 11 modules:</p> <ul style="list-style-type: none"> ■ The value chain approach/selecting value chains (Module 1) ■ Structural, economic, social and environmental analysis of value chains (Module 2) ■ Determining a vision and upgrading strategy (Module 3) ■ Organising programs and projects (Module 4) ■ Applying VC Upgrading solutions (Modules 5-10) ■ Monitoring and data management (Module 11). <p>ValueLinks 2.0 uses a systems approach based on a broad definition of value chains including micro level (companies), meso level (support functions) and macro level (policy and enabling environment) functions. Compared with ValueLinks 1.0, the new edition focuses much on environmental and social analysis and green and social upgrading considerations.</p>
How to be used	> To be used for sustainable project planning and implementation.
Format	> The ValueLinks 2.0 manual (volumes I and II) serves as the basic reference document. ValueLinks 2.0 training seminars are conducted for capacity development in different languages.
Main users	> Project planners, implementers and project partners.
Language	> The ValueLinks 2.0 manual is available in English. Training material (PowerPoint slides) is available in English, French, Spanish, Portuguese, Russian, Vietnamese and other languages.
Time requirement	> ValueLinks training seminars span over a duration of 1 week.
Difficulty	> Medium/Professional: Users should have a professional background in economic development, agriculture or agri-food systems.
Links	> www.valuelinks.org
Contact	> info@valuelinks.org
Comments	> ValueLinks 2.0 is applied by many GIZ projects worldwide as a key framework for project planning and implementation particularly related to agricultural value chains, agri-food systems, regional economic development and biodiversity-based products.

Climate Finance Training for Sector Experts (CliFiT4SE)



Developed by	> Developed by adelphi on behalf of GIZ
Exists since	> 2017, updated in 2019 and 2021
Scope of application	> CliFiT4SE is a modular training package that introduces the basis of project development for the Green Climate Fund (GCF).
Objective	> Building capacities among sector stakeholders, governments, etc. to develop bankable project ideas for the Green Climate Fund.
Outputs	> Better understanding of international climate finance landscape, GCF project cycle and investment criteria, and key design elements of GCF projects.
Short description	> The training package entails three sector modules (Agriculture, Water, and Transport), each of which is divided into three thematic modules (climate finance basics, climate rationale, and implementation structure): <ol style="list-style-type: none"> 1. Climate finance basics: The introductory module of the toolkit aims at making participants familiar with climate change related concepts and the respective terminology – including key concepts of climate science, the international climate change regime as well as the international climate finance landscape. Participants are also introduced to the Green Climate Fund (GCF), its investment criteria, resource allocation, and project requirements. 2. Climate Rationale: The modules of Climate Rationale introduces three tools that enable participants to refine their project ideas and make them fit for climate finance opportunities. 3. Implementation Structure: This module comprises three tools that enable participants to set up a robust implementation structure for climate projects.
How to be used	> The training is demand-based and needs to be organized by the respective institution or project. As a modular training package, each training is tailored to the needs of the target group and must be implemented by certified trainers (no self-paced training).
Format	> The training material consists of a series of PowerPoint presentations, containing presentation material as well as interactive elements. It can be implemented both face-to-face and in a virtual setting.
Main users	> Any interested institution may implement the training and make use of the materials. The training specifically targets sector stakeholders, government officials, and private sector actors who are interested or involved in climate finance programming.
Language	> English, French, Spanish
Time requirement	> Very flexible and based on the target group's needs and demands. For virtual training implementation, a maximum of 3 half-days is recommended, face-to-face trainings can be longer.
Difficulty	> Medium
Links	> Official website
Contact	> For access to the trainer pool and training materials, please contact lisa.scholz@giz.de and kateryna.stelmakh@giz.de .
Comments	> –

Participatory Integrated Climate Services

for Agriculture (PICSA) and Digital PICSA (E-PICSA)



Developed by	> University of Reading and Partners
Exists since	> PICSA since 2014, E-PICSA since September 2022
Scope of application	> Project planning based on participatory methods and up-to-date climate information.
Objective	> Combines historical climate data and forecasts with farmers' knowledge of what works in their own context and then uses participatory planning methods to help farmers make informed decisions about their agricultural practices.
Outputs	> E PICSA supplements the PICSA training for farmers through provision of up-to-date climate information (historical and forecast), enhancing the speed and scope of analysis, increasing the range of coping and adaptation practices that can be considered, enabling easier exploration of budgeting scenarios (for example (e.g.), and improving recording and monitoring to facilitate feedback and learning.
Short description	<p>> The Participatory Integrated Climate Services for Agriculture (PICSA) approach aims to facilitate farmers to make informed decisions based on accurate, location specific, climate and weather information; locally relevant crop, livestock and livelihood options; and with the use of participatory tools to aid their decision making. Key components of PICSA are:</p> <ul style="list-style-type: none"> ■ Providing and considering climate and weather information with farmers including historical records and forecasts ■ Joint analysis of information on crop, livelihood and livestock options and their risks (field staff and farmers) ■ A set of participatory tools to enable farmers to use this information in planning and decision making <p>Digital Participatory Integrated Climate Services for Agriculture (E-PICSA) supplements PICSA through provision of data which help the farmers to make better decisions for their individual farm and household contexts to improve yields, food security, incomes and resilience.</p>
How to be used	<p>> E PISCA App can be directly used by fieldworkers and farmers and contains the following components:</p> <ol style="list-style-type: none"> 1. Historical climate tool >>> Provides automatically updated, locally specific climate information graphs to enable farmers and agricultural field staff to analyze their climatology. 2. Probability and risk tool >>> Enables immediate calculation of simple probabilities and risks. Farmers use this to identify which specific crops and varieties have the best chance to succeed in their location. 3. Options analysis tool >>> Farmers identify and assess a range of different options aimed at increasing production, income and resilience. 4. Participatory budget tool >>> Fully interactive budget tool to enable farmers to evaluate and plan in detail the different options they want to consider and implement. 5. Location specific long and short-term forecasts >>> Automatically updated access to the best and most locally specific short and long-term forecasts provided by National Meteorological Services. 6. Training materials and videos >>> Materials to support training including videos on each of the different tools and guides and to address frequently asked questions. 7. Communication tools >>> Direct links to communication channels so that agricultural field staff and farmers can interact and share ideas / queries with their peers and the PICSA 'experts'. 8. Technical and market information >>> Direct links to established, relevant and carefully selected sources of technical agricultural information as well as to market price information. 9. Data collection and monitoring >>> The application (App) will enhance data collection for monitoring, evaluation and learning for farmers, agricultural field staff and public and private organizations.
Format	> pdf Training Manual for PICSA Agricultural extension and climate services App (E PICSA)



Main users	> Fieldworkers and project implementing entities (e.G NGOs).
Language	> Various adapted to local languages. Currently English and Chichewa.
Time requirement	> The training for farmers takes 6 days; daily sessions 2 – 3 hours.
Difficulty	> Simple
Links	> <u>E-PICSA Web version</u> PICSA Offline version <u>PICSA – Participatory Integrated Climate Services for Agriculture</u> PICSA Field Manual <u>PICSA Manual – a guide for use in training with farmers</u>
Contact	> <u>g.clarkson@reading.ac.uk</u> <u>p.t.dorward@reading.ac.uk</u>
Comments	> PISCA is based on Rapid Rural Appraisal methodologies.

Rapid Loss Appraisal Tool (RLAT)



Developed by	> Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
Exists since	> 2015, Latest update 2021
Scope of application	> Assessing hotspots for food loss in agricultural value chains (VCs).
Objective	> To provide hands-on strategic orientation to those developing realistic and effective measures for sustainable food loss reduction.
Outputs	> <ul style="list-style-type: none"> ■ Easily manageable methodology to identify food loss hotspots along agricultural VCs. To serve as a pre-screening tool for further in-depth studies and to identify leverage points for reducing losses at the various VCs stages.
Short description	> <p>Tackling food loss and waste represents a triple win opportunity – for the climate, for food security, as well as for the sustainability of our agrifood systems. Food loss and waste accounts for 8–10 percent of global greenhouse gas emissions (GHGs), With RLAT food loss hotspots can be detected along agricultural value chains and effective measures for loss reduction can be derived.</p> <p>RLAT was initially developed and implemented for the maize VCs and can easily be adapted to other VC. The tools and approaches have been simplified for rapid implementation at the local level, enabling users to collect information quickly and systematically, assess stakeholder perceptions of food losses and triangulate the finding using fast-track multiple evaluation methods that make it possible to confirm the results without undertaking representative sample surveys.</p> <p>The sections on Participatory Methods and Biophysical and Mycotoxin Assessments explain about ready-to-use instruments including well-established methods, for example (e.g.) transect walk and loss perception rankings. The toolbox provides proposals for workshop programs, hints for focus group meetings, guidance for the assessment of the prevalence of mycotoxins as well as sampling methods and bio-physical measurements to complement the results of stakeholder workshops and focus group discussions. Furthermore, the sections Checklists and Mycotoxin Estimation Sheets and Documentation of Results provide hands-on material to enable facilitation in the field, as well as for documentation and assessment of findings.</p>
How to be used	> By using the step-by-step instruction in the RLAT User Guide the RLAT Toolbox can be used.
Format	> pdf document
Main users	> <ul style="list-style-type: none"> ■ Project planners and implementers ■ VC actors
Language	> English, French
Time requirement	> 10 days, time of application can nevertheless be spread over several weeks (2 phases possible), implementation period should be shortly after harvest time.
Difficulty	> Medium (knowledge of VCs recommended, facilitation/moderation competencies).
Links	> Toolbox User Guide
Contact	> sv.le@giz.de
Comments	> A qualitative tool with no specific climate lens but climate relevance.

Toolbox on Solar Powered Irrigation Systems (SPIS)



Developed by	> <ul style="list-style-type: none"> ■ Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) ■ Food and Agriculture Organization of the United Nations (FAO)
Exists since	> 2018
Scope of application	> Implementation/capacity building for efficient use of solar powered irrigation systems.
Objective	> <ul style="list-style-type: none"> ■ Support informed decision making on SPIS (Solar Powered Irrigation Systems) ■ Promotion of modern and efficient small-scale SPIS ■ Improve capacity of advisors, service providers and practitioners on SPIS in order to allow end-users, policy makers and financiers to take informed decisions.
Outputs	> Builds capacities of extensionists, service providers and practitioners to provide profound and hands-on advisory services for end-users in SPIS.
Short description	> <p>Due to significant advances in technology and drops in prices for solar panels, solar pumps have become an economically, technically and environmentally viable alternative to conventional pumping systems.</p> <p>The Toolbox on SPIS enables advisors, service providers and practitioners to provide broad hands-on guidance to end-users, policymakers and financiers in the field of solar irrigation. It comprises informative modules supplemented with hands on tools. The Toolbox provides several modules: Safeguard Water, Market, Invest, Finance, Design, Set Up, Irrigate, Maintain.</p>
How to be used	> <ul style="list-style-type: none"> ■ Download mobile or desktop application (App) ■ As extension/advisory instruments: introductory reading ■ Modular use (depending on customers' needs and advisor's objective and background)
Format	> <ul style="list-style-type: none"> ■ Tools: Excel and Word sheets ■ Handbooks & Modules: pdf ■ Toolbox and training materials (pdfs, pics) ■ Tutorial Videos, e-learning ■ Mobile App: Android
Main users	> <ul style="list-style-type: none"> ■ Technology providers ■ Trainers & agricultural extension services ■ Development practitioners ■ Financial institutions
Language	> English, French, Spanish, Arabic
Time requirement	> <p>Tools: Depending on the tool used (range from very short – checklists to various hours or even days when considering data gathering).</p> <p>Modules: readings of 20 pages max.</p> <p>Introductory/ User training courses range from 1 to 4 days.</p>
Difficulty	> <p>Simple: Reading of modules</p> <p>Medium to professional: Users of tools need to have expertise in at least one of the fields (agriculture, water management and pumping) when applying the tool for advisory.</p>
Links	> <p>Information</p> <p>Toolbox</p> <p>Mobile App</p>
Contact	> we4f@giz.de
Comments	> –



Developed by	> <ul style="list-style-type: none"> ■ Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) ■ adelphi
Exists since	> 2018
Scope of application	> Adaptation planning and development of adaptation measures in businesses.
Objective	> <p>The Climate Expert aims at raising awareness and building practical skills of Small and Mid-sized Enterprises (SMEs) to prepare for the impacts of climate change. Correctly identifying and interpreting the risks and opportunities of climate change is difficult. However, adaptation to climate change should be part of any company's regular strategic management – by reacting to changes before they take place, businesses will become fit for the future.</p>
Outputs	> Business planning under climate change considerations
Short description	> <p>Adapting to climate change is crucial both for business survival and growth. Businesses which prepare for, or "adapt" to, climate change impacts, first and foremost assure their business survival in times of a changing climate. At the same time, companies can make use of business opportunities resulting from a changing climate, e.g., by developing adaptation products and services for people and organizations.</p> <p>The Climate Expert website contains a toolbox with materials and further information on climate change adaptation as well as the Climate Expert approach. Based on an excel-tool and additional work material, company assessments are conducted in a simple five-step process that also features a cost-benefit analysis:</p> <ol style="list-style-type: none"> 1. Identification and analysis of climate change impacts 2. Assessing climate risk and analysing climate change opportunities 3. Identification of suitable adaptation measures (cost-benefit analysis) 4. Development of an adaptation strategy 5. Identification of suitable financial instruments
How to be used	> <ul style="list-style-type: none"> ■ Read working materials ■ In-person/ remote training of consultants ■ On-site company assessments
Format	> <ul style="list-style-type: none"> ■ Guide for Industrial Zones ■ Full Company Assessment + Excel Tool ■ Quick Company Assessment ■ Training of Consultants (ToC) Package (12 sessions) ■ Catalogue of Climate Change Adaptation Measures ■ Online Adaptation Course (currently not available) ■ Case Studies ■ Consultant Data Base
Main users	> <ul style="list-style-type: none"> ■ Development organisations / implementation agencies ■ Local business development service providers / multiplier organizations ■ SMEs
Language	> English, French, Spanish, Russian, Tajik



Time requirement	> Depending on depth of training program and tool application: Climate Expert Program: 3-24 months ToC Training: 4-7 days ToC Training with Company Visit: 5-10 days Quick Company Assessment: 15-60 minutes Full Company Assessment: 1-3 days ITC Online Course: 6 hours over 2 weeks
Difficulty	> Medium
Links	> <u>Website</u> <u>Tools</u> ITC is offering an online course for SMEs based on the Climate Expert approach <u>ITC SME Trade Academy - Summary of Becoming a Climate Resilient SME</u>
Contact	> Sector Project Sustainable Economic Development <u>yan.chen@giz.de</u> , <u>florian.gueldner@giz.de</u>
Comments	> Well prepared and easy to understand tools

A woman wearing a patterned headscarf is shown in profile, looking down and writing in a notebook. She is holding a pen in her right hand. The background is a blurred outdoor setting with green foliage. The entire image has a purple tint. A small purple square is located to the left of the text box.

Information Tools / Web-Portals

Climate Risk Country Profiles



Developed by	<ul style="list-style-type: none"> ▪ International Center for Tropical Agriculture (CIAT) ▪ Research Program on Climate Change, Agriculture and Food Security (CCAFS) ▪ Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) ▪ World Bank ▪ Centro Agronómico Tropical de Investigación y Enseñanza (Costa Rica's CATIE) ▪ United States Agency for International Development (USAID) Bureau for Food Security
Exists since	2014, Latest Profile 2021
Scope of application	Climate risk information for specific countries and value chains.
Objective	<ul style="list-style-type: none"> ▪ To identify challenges for the agricultural sector, present already existing practices and lessons learned from case studies. ▪ To help open pathways for sustainably increase productivity, adapt, and build resilience to climate change, and reduce greenhouse gas (GHG) emissions where possible.
Outputs	<ul style="list-style-type: none"> ▪ Climate Smart Agriculture (CSA) Country Profiles ▪ Climate Risk Profiles
Short description	<p>CSA Country Profiles: Quick and easy to read, the CSA country profiles give an overview of the agricultural challenges in 14 countries, and how CSA can help them adapt to and mitigate climate change. The country profiles provide a snapshot of a developing baseline created to initiate discussion at both the national and global level about entry points for investing in CSA at scale. The briefs outline the country-specific CSA considerations and highlight their relation to adaptation, mitigation, productivity, institutions and finance (Latin America and the Caribbean, Africa, Asia, Europe).</p> <p>Climate Risk Profiles: Developed for specific value chains to give an in-depth view and to guide the implementation (45 rural counties in Kenya).</p> <p>GIZ GICE Climate Risk Profiles: Risk profiles adapted for use in guiding GIZ Green Innovation Centres (Ivory Coast, Malawi, Nigeria, Togo, Mali, Tunisia, Vietnam, Zambia, Ghana, Kenya, Cameroon, Ethiopia, Benin, India, Mozambique).</p>
How to be used	The profiles are pdf Documents that can be read in order to get an overview on respective national contexts with key facts in agriculture and climate change, CSA technologies and practices, institutions and policies for CSA and financing CSA.
Format	pdf documents
Main users	<ul style="list-style-type: none"> ▪ Planners and policy makers ▪ National implementing entities
Language	English
Time requirement	Depending on the needs of the reader, within an hour an overview is gained.
Difficulty grade	Simple
Links	Country Profiles Website CIAT Climate Smart Agriculture Country Profiles Kenya Climate Risk Profiles GIZ GICE Climate Risk Profiles
Contact	Evan Girvetz e.girvetz@cgiar.org
Comments	–

AGRICA – Climate risk analyses for adaptation planning

in sub-Saharan Africa



Developed by	<ul style="list-style-type: none"> ▪ Potsdam Institute for Climate Impact Research ▪ Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), financed by the Federal Ministry for Economic Cooperation and Development (BMZ)
Exists since	2018
Scope of application	Climate risk information for specific countries informing adaptation planning.
Objective	<ul style="list-style-type: none"> ▪ To address the need for science-based adaptation planning which requires and assessment of potential adaptation strategies. ▪ To inform national and sub-national adaptation planning including National Determined Contributions (NDCs) and the National Actionplan (NAP) development and review processes but will also provide useful information and evidence to decision makers at other planning and implementation levels.
Outputs	Comprehensive climate risk analyses for the agricultural sector in selected countries in sub-Saharan Africa. So far, 8 climate risk analyses completed or in progress (final: Ethiopia, Ghana, Burkina Faso, Niger; in progress: Cameroon, Zambia, Uganda); and 15 climate risk profiles have been published (Burkina Faso, Cameroon, Côte d'Ivoire, Ethiopia, Ghana, Kenya, Madagascar, Mali, Mauritania, Niger, Senegal, Tanzania, Tchad, Uganda, Zambia) as a compact and country-specific overview of existing and expected climate risks in relevant sectors.
Short description	<p>AGRICA currently focuses on the development of two publication formats: In-depth climate risk analyses are detailed scientific reports accompanied by a summary for policy makers and a methods factsheet. The studies model the full impact chain from a changing climate, to changing water availability and resulting climate impacts on the agriculture sector.</p> <p>Based on this information, the studies then identify and analyze suitable adaptation strategies based on their feasibility, cost-effectiveness, biophysical performance and aptitude for local conditions. The climate risk analyses are intended to inform decision makers from governments, international institutions, civil society, academia and the private sector regarding the risks of climate change impacts and provide guidance in effective adaptation planning at national and sub-national level.</p> <p>Shorter climate risk profiles focus on climate impacts and risks to the infrastructure sector, agricultural productivity, agro-ecological zones, water availability and human health. It is providing an easy-to-read snapshot.</p>
How to be used	By navigating through the interactive website.
Format	<ul style="list-style-type: none"> ▪ Interactive Map ▪ Information documents (pdf)
Main users	Decision makers from governments, international institutions, civil society, academia and the private sector for national and sub-national adaptation planning.
Language	English, French
Time requirement	2 hours
Difficulty grade	Simple
Links	<p>Website</p> <p>Interactive Map</p>
Contact	Dr. Christoph Gornott gornott@pik-potsdam.de
Comments	AGRICA focusses on Sub-Saharan Africa and the agricultural sector – guided by the priority areas of German development cooperation and partner countries particularly affected by climate change. Different supplements to the CRPs are planned: examine climate effectiveness of interventions and giving policy recommendations, extension to additional thematic areas and sectors besides agriculture, such as value chains, gender, water, deforestation, and climate risk finance, transnational risk analyses, development of knowledge products for different target groups.

Climate Action Tracker (CAT)



Developed by	> <ul style="list-style-type: none"> ■ Climate Analytics ■ ECOFYS (Guidehouse Ecofys) ■ New Climate Institute ■ Potsdam Institut für Klimafolgenforschung (PIK)
Exists since	> 2009, Latest update 2022
Scope of application	> Project phase: monitoring and evaluation (M&E) Value Chain Activity: all
Objective	> To track government climate action and measure it against the globally agreed Paris Agreement aim of "holding warming well below 2°C, and pursuing efforts to limit warming to 1.5°C."
Outputs	> <ul style="list-style-type: none"> ■ Tracking of national actions: <ul style="list-style-type: none"> ■ Effect of climate policies and action on emissions ■ Impact of pledges, targets and National Determined Contributions (NDCs) ■ Comparability of effort against countries' fair share and modelled domestic pathways ■ Assesses of the total global effort of NDCs, pledges and current policies on: <ul style="list-style-type: none"> ■ Global warming over the 21st century ■ Emissions Gap
Short description	> This is not a tool as such, but a website that offers useful information on the climate actions of 39 countries, covering 85% of global emissions. The CAT quantifies and evaluates climate change mitigation targets, policies and action. It also aggregates country action to the global level, determining likely temperature increases during the 21st century using MAGICC climate model. CAT further develops sectoral analysis to illustrate required pathways for meeting the global temperature goals.
How to be used	> The selection of the country leads the user to the country description. Further specific information is provided.
Format	> Interactive website
Main users	> Sector planners
Language	> English
Time requirement	> 1 hour
Difficulty grade	> Simple – Medium
Links	> Website
Contact	> info@climateactiontracker.org
Comments	> A simple yet informative source of climate action related information. The user has the possibility to further follow up on specific climate information that is provided on the website.

Searching Machines for relevant Tools



Accelerating Impacts of CGIAR Climate Research

for Africa (AICCRA) Learning Zone



Developed by	>	<ul style="list-style-type: none">■ Consultative Group on International Agricultural Research (CGIAR)■ Alliance Bioversity International & International Centre for Tropical Agriculture (CIAT)
Exists since	>	2021
Scope of application	>	Extensive Search for Tools to accelerate climate action across Africa.
Objective	>	To help select the tool that is most appropriate to the needs of the user.
Outputs	>	Recommendation of tools to be used for coordination and support actions (CSA) projects with evaluation of the usefulness of the tool.
Short description	>	<p>The AICCRA Learning Zone is a convenient one-stop shop for analytical resources – case studies, training guides, articles and videos – that helps users to make informed decisions in agriculture.</p> <p>These open-access resources help put climate-smart agriculture into practice in Africa and cover a variety of themes, target different users and focus on specific project phases.</p> <p>Focus countries are: Senegal, Mali, Ghana, Ethiopia, Kenya and Zambia.</p> <p>The learning zone is a living database that allows users to upload content themselves, so that AICCRA colleagues can further add to the library. Uploaded content is reviewed by the AICCRA team to ensure proposed materials are relevant and meet the highest standards of quality.</p>
How to be used	>	By using a step-by-step filter (Thematic Area, Target User and Project Phase)
Format	>	Interactive website
Main users	>	<ul style="list-style-type: none">■ Farmers■ Policymakers
Language	>	English
Time requirement	>	30 minutes
Difficulty grade	>	Simple
Links	>	Website
Contact	>	Contact form
Comments	>	This is not a tool for climate change adaptation and mitigation in agriculture but helps to find them.

Climate Toolbox – NDC Partnership



Developed by	> National Determined Contributions (NDC) Partnership
Exists since	> 2021
Scope of application	> Extensive Search for Tools to help countries plan and implement their NDCs.
Objective	> To support government officials, implementing partners, and any other parties working on NDC planning and implementation.
Outputs	> Relevant guidance and frameworks, templates, analysis tools, links to other knowledge platforms, and sources of technical support across a wide range of sectors, themes, and activity types.
Short description	> The Climate Toolbox is a curated, searchable database of tools and resources to support NDC planning and implementation. The Climate Toolbox draws together the most relevant resources from the NDC Partnership's members and other leading institutions. Content from over 200 organizations can be referenced and accessed here. The resources in the Climate Toolbox are structured around specific activities and sub-activities associated with NDC planning and implementation, spanning across mitigation and adaptation actions. All content is searchable by sector, theme, region, scale, resource type, expertise level, and language. These criteria were developed to enable you to easily find and access the resources most relevant to your needs.
How to be used	> Using the step-by-step filter
Format	> Interactive website
Main users	> <ul style="list-style-type: none"> ■ Government officials ■ Implementing partners
Language	> English
Time requirement	> 30 minutes
Difficulty grade	> Simple
Links	> Toolbox Information
Contact	> Support
Comments	> This is not a tool for climate change adaptation and mitigation in agriculture but helps to find them. The Toolbox finds several relevant tools, but the filter should not be set too tight.

Climate Risk Assessment Method Search Engine (CRAMSE)



Developed by	> Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
Exists since	> 2021
Scope of application	> Extensive Search Engine for Tools on climate risk assessment (CRA)
Objective	> <ul style="list-style-type: none"> ■ Providing a database on an extensive number of existing methods and highlighting relevant aspects ■ Help to navigate through the variety of existing methods
Outputs	> Suitable climate risk assessment methods
Short description	> <p>CRAMSE includes more than 120 climate risk assessment methods. The searching engine helps to navigate through the variety of existing methods.</p> <p>It shall be noted that the presented overview is, however, bound to the capacity of interpretation of the analysts who reviewed the available methods and their descriptions based on a fixed set of criteria.</p> <p>The search engine can filter by 13 options, including hazards, sectors, geographic coverage and language.</p>
How to be used	> Using the step-by-step filter
Format	> Interactive website
Main users	> <ul style="list-style-type: none"> ■ Decision makers ■ Technical experts ■ Project staff
Language	> English
Time requirement	> One hour
Difficulty grade	> Simple
Links	> Search engine Background
Contact	> Maximilian Högl maximilian.hoegl@giz.de
Comments	> <p>This is not a tool for climate change adaptation and mitigation in agriculture but helps to find them.</p> <p>The sector filter does not include agriculture but others like Livelihood and Water sector, that are relevant for agriculture.</p>



Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Registered offices
Bonn and Eschborn

Friedrich-Ebert-Allee 36 + 40
53113 Bonn, Germany
T +49 228 44 60-0
F +49 228 44 60-17 66

Dag-Hammarskjöld-Weg 1 - 5
65760 Eschborn, Germany
T +49 61 96 79-0
F +49 61 96 79-11 15

E info@giz.de
I www.giz.de

On behalf of



Federal Ministry
for Economic Cooperation
and Development