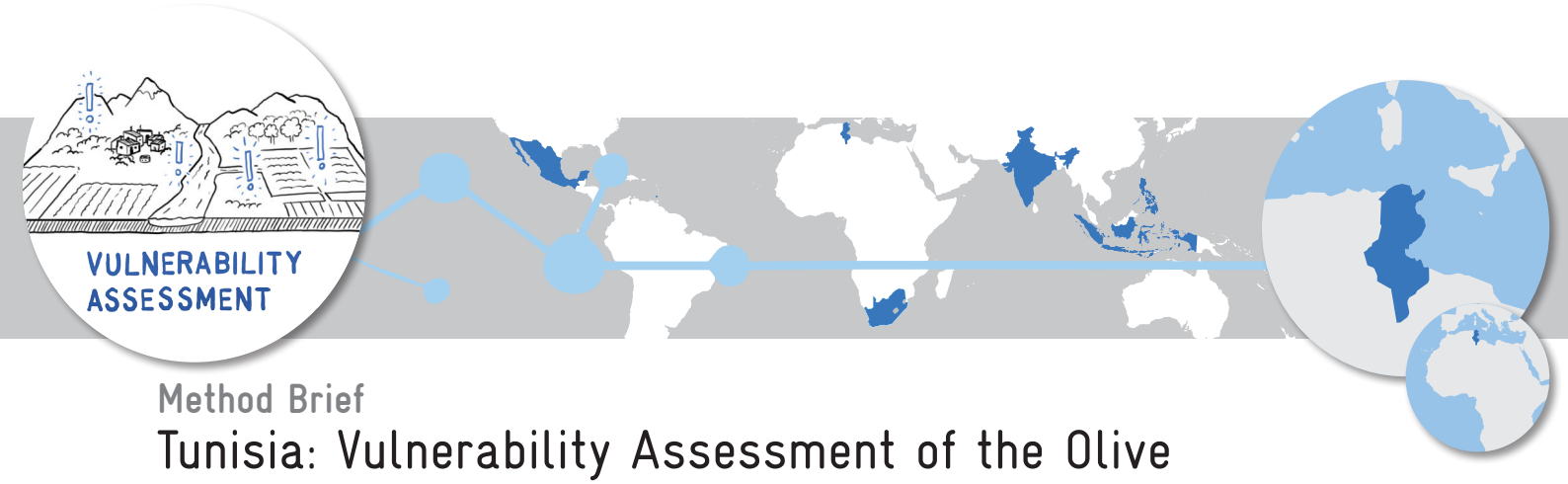

Method Brief

Tunisia: Vulnerability Assessment of the Olive Plantation Ecosystem

Method

A Vulnerability Assessment (VA), previously applied in the olive oil sector in Tunisia was adapted to the analytical framework of 'the archetype approach' developed by the Potsdam Institute for Climate Impact Research (PIK). The outcomes feed into the planning of olive cultivation within the agricultural development agency of Médenine, Tunisia.

Scope and entry points

This VA was a pilot within the framework of the 'vulnerability analysis of the agricultural sector and water to climate change in the south of Tunisia' which is supported by the project 'Climate Impacts: Support Platform For Global And Regional Adaptation' known as ci:grasp). This method supports concerned actors, regional authorities, regional agricultural development commissions (CRDA), agencies, research centres and agricultural development organisations (GDA), NGOs etc., with an appropriate methodological approach for a VA on one hand, and for the sustainable optimisation of development planning in view of CC on the other. The olive oil sector was chosen because of its socioeconomic predominance at regional and national levels.

How it works

Vulnerability schemes that exist in various places around the world have been identified as 'vulnerability archetypes' (archetype = model). As a reminder, 'vulnerability' refers to the extent a system is sensitive to – or unable to cope with – negative climate change impacts, including climate variability and extreme events. A 'vulnerability archetype' is therefore defined as a 'representative model of the interactions between the environmental changes and human well-being' (for instance the urbanisation of coastal strips or subsistence farming on marginal lands in developing countries). It does not describe a specific situation, but focuses on common properties of a multitude of cases covered by this type of 'archetype'. The method allows studying the links between the factors in a given sector, influenced by multiple stress factors.

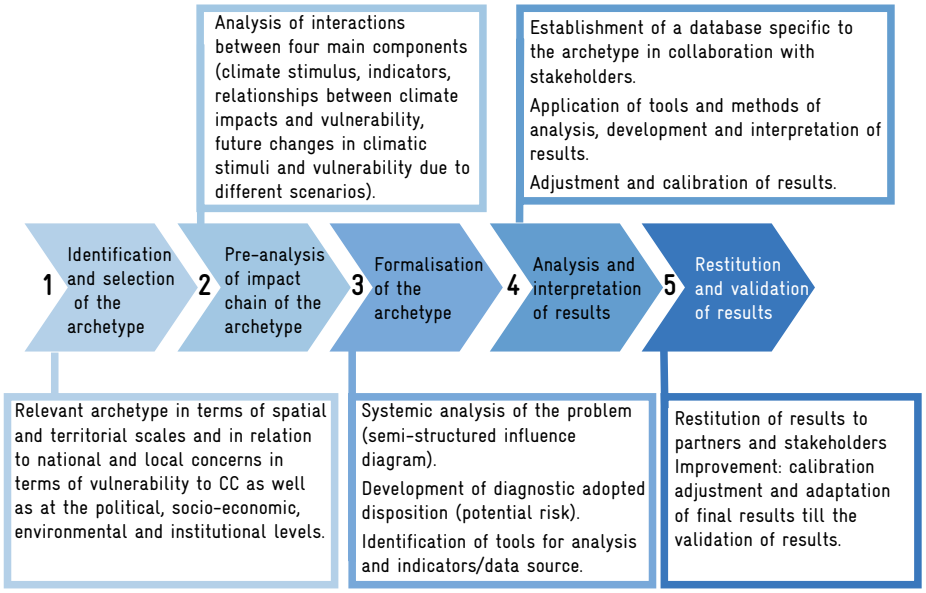

Figure: Stages of the vulnerability analysis to CC approach (ci:grasp/Tun)

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The complex stages have been partly simplified. Only stages 2 and 3 – which require greater clarification – are explained in more detail below.

Stage 2: Impact chain pre-analysis

This pre-analysis is summarised in the following diagram, with four main components: 1) Choice of exposure unit, identification of target group, stakeholders, and relevant climate stimuli, 2) Analysis of direct and indirect impacts, 3) Risk assessment, 4) Recommendations for adaptation options.

In order to facilitate the transfer of the method to other concerned actors, e.g. to agricultural specialists involved in development planning some steps were simplified. Simplifications covered the analysis tools and the types of impacts to be monitored. The adaptation measures (step 4) are recommendations based on experience, rather than the outcome of a rigorous identification that would have included the assessment of the potential impacts of such measures.

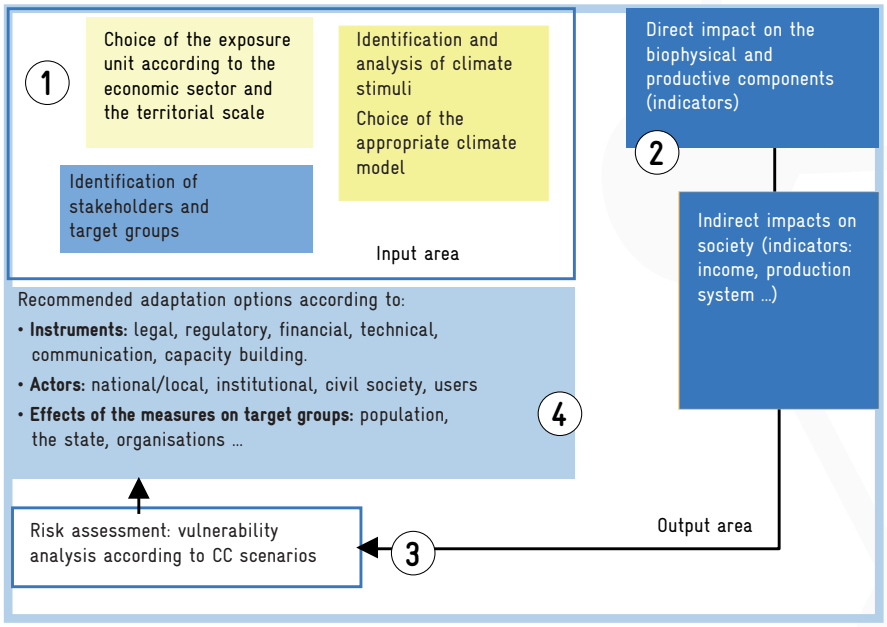

Figure: Process of pre-analysis of the impact chain

Stage 3: Archetype formalisation

In the next step the interrelations between the main components such as water resources, soil, farming practices, or political measures and the sector targeted by the VA are identified in order to analyse the systemic functioning of an archetype (systemic approach). The variables and parameters to be factored into inputs (particularly the climatic stimuli and biophysical and socioeconomic parameters) and output indicators (vulnerability indicators) are defined by specifying the possible relationships and combinations. The climate scenarios are included in the form of 'stressors' (parameters for implementing the climate shocks).

The choice for an analysis tools fell on a water balance model (BUDGET; public domain software www.iupware.be), and GIS tools for the spatial overlay and analysis of several layers (pedologic maps, soil fitness categories). Three scenarios were considered with and without CC by 2020 and 2050 and were applied to all possible topographic combinations (mountains, plains), soils (all soils), meteorological stations and precipitation stations in the region.

Specifics of application

Stakeholders and institutional set-up

The leading actors are the Institut des Régions Arides (IRA), the CRDA of Médenine and the CC/GIZ project. The method was implemented by a team composed of two specialists from IRA, who benefited from sharing experience with specialists from PIK, and other specialists in various fields (pedology, ecology, combat against desertification, plant production, water resources) involved on a regular basis. Special attention was given to the consultation and cooperation process with the actors from the regional agricultural development sphere.

Input

The approach requires specialists in climate and environmental modelling, in environmental and geographic information systems, specialists in appropriate fields related to the methodology and concept needs of the archetype. The initial lack of integration of the topic in the institutions as well as the lack of resources in research institutions make external funding necessary and call on consulting specialists. The most important input is the current ground data, of which some (e.g. meteorological data from certain stations) are expensive. The required maps need to be adjusted and updated. The pilot application lasted approximately 18 months, a period required not only to adapt the method but also to ensure the participative approach and the involvement of stakeholders. This aspect incurred additional costs, for instance the organisation of exchange workshops.

Output

The following products could be leveraged in the short term:

- A geographic database for the 'olive oil cultivation system' archetype.
- A land fitness map for olive cultivation in the Governorate of Médenine.
- A land sensitivity to CC map for olive cultivation in the Governorate of Médenine.

Capacity required and ease of use

The implementation of the method, even if simplified, is demanding:

- Human resources working interdisciplinary. People who master the method, which remains quite complex as it requires both a systemic and an analytical approach.
- Setting up a partnership process with the actors and partners involved from the identification of the archetype in response to a priority and real concern of society until the stage of outcome validation.

Conclusions for future applications

Outcome and added value

The tools developed as part of the method include mapping databases, which can be customised by integrating CC scenarios. In addition, they can supply various thematic outputs that facilitate decision-making in ecosystem planning and agro system management.

The implementation of the pilot involved the training of CRDA specialists (representatives of various districts), in order to install the GIS system within the CRDA and carry out a communication activity with an NGO. At present, the specialists are using the outcomes to sensitise farmers who wish to expand their plantations, or to support farming improvements. The utilisation of the olive oil sector in planning guidance in the governorate of Médenine has not yet been put into practice; constraints linked to the regional planning process, which is currently being re-organised, must first be overcome.

Cost-benefit ratio

This can be considered satisfactory. Methods and tools are implemented at regional level and the outcomes obtained have attracted the interest of local as well as national actors, such as the IO, a specialised institute, which is focusing more attentively on the CCA issue within the framework of a cooperation between the IRA and the GIZ.

Potential for replication

Such methods contribute greatly and in a more detailed manner than at national level to improved effectiveness in developing adaptation measures. They are very useful in meeting the rationale requirements for project requests for adaptation to CC funds or to other funding sources, for which there is significant demand from development actors.

The ownership of the method by the 'developers' remains contingent on improving the methodology such as the development of an evaluation stage for adaptation alternatives, as well as the validation and extrapolation process of the tools/outcomes. Indeed the reproduction of this method by development actors could only take place once recognition and validation has been achieved at central level (for example the Ministry of Agriculture).

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Documents

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