

1-3 April 2014 – Paris – France

From science to practice: the contribution of projects TipTree and AMTools to guiding better forest survival and regeneration under global change scenarios

Maximize the production of goods and services of Mediterranean forest ecosystems in the context of global changes

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FAO – *Silva Mediterranea*

<http://www.fao.org/forestry/82782/en/>



Objectives of the project funded by the French Global Environment Fund (FFEM)

Aim: encourage stakeholders to manage/restore Mediterranean woodlands to ensure a sustained provision of goods and services by these ecosystems

Objectives:

1. Integrate climate change impacts in forest policies by providing information and tools related to forests vulnerability and adaptation capacities;
2. Assess the economic and social values of goods and services rendered by Mediterranean wooded ecosystems, to support decision-making processes and promote the integration among sectoral policies;
3. Improve governance of woodlands at territorial scale through participation of stakeholders in the conception and implementation of strategies aimed at reducing the pressures on ecosystems;
4. Maximize and value the mitigation function of Mediterranean forests with methodological tools to value local efforts of ecosystems protection/restoration ;
5. Strengthen coordination and exchanges of experiences among stakeholders in the region: coordination and communication through the CPMF (Collaborative Partnership on Mediterranean Forests).

Components of the project funded by FFEM

Component 1 : Production of data and tools supporting decision making relating to the vulnerability of Mediterranean forest ecosystems to climate change impacts and their adapting capacities (FAO)

Component 2 : Estimation of the social and economical value of goods and services provided by Mediterranean forest ecosystems, to raise awareness, support decision and promote integration among sectoral policies (Plan Bleu)

Component 3 : Development of participative governance approaches at territorial scale (Plan Bleu)

Component 4 : Optimization and valorization of the mitigation potential of Mediterranean forests (carbon sinks) through the development of methodological tools to value local efforts of protection/restoration (FAO)

Component 5 : Strengthening of coordination activities and exchanges of experiences within the CPMF and promotion of project results and Mediterranean forests specificities on the international scene

Component 1: Production of data and tools to support decision making relating to the vulnerability of Mediterranean forest ecosystems to climate change impacts and their adapting capacities

1. Literature review, synthesis on the impacts of climate change on Mediterranean forests and activities implemented to adapt Mediterranean forests to climate change in the region (FAO-*Silva Mediterranea*);
2. Review of literature on the impact of climate change on Mediterranean forests focusing on the management of forest genetic resources (mainly in partner countries and selected pilot sites). Production of maps showing the distribution of forest tree species selected in the pilot sites in collaboration with national experts (including marginal-peripheral populations) (INRA Avignon);
3. Vulnerability assessment to climate change of Mediterranean forest ecosystems in five pilot sites (FAO in collaboration with several international and local experts);
4. Capitalization of outcomes and elaboration of tools to support decision making in terms of adaptation to climate change for forest managers and policy makers;
5. Exchanges of experiences between countries, included countries involved in the project MED ForClimAdapt, through a regional workshop

Pilot sites



Duzlerçami - Turkey

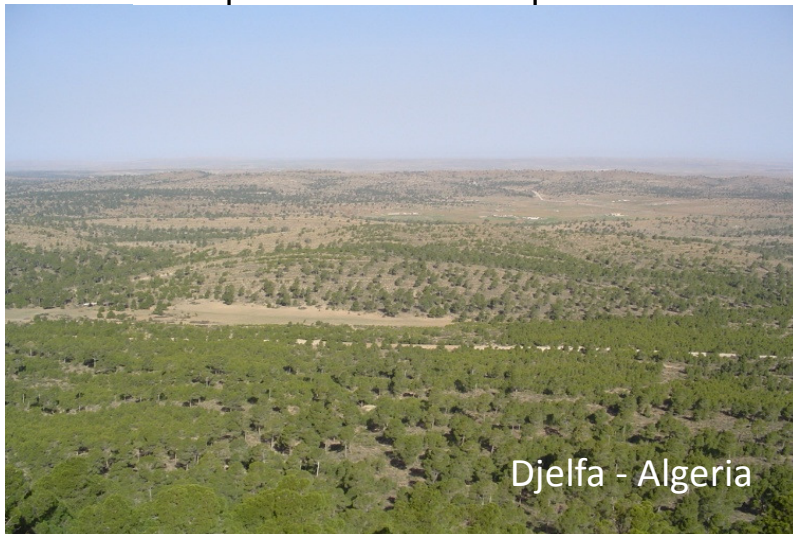


Jabal Moussa - Lebanon



Siliana - Tunisia

Algeria	Lebanon	Morocco	Tunisia	Turkey
Chrea	Jabal Moussa		Barbara	Duzlercami
Djelfa/Senalba		Maamora	Siliana	



Djelfa - Algeria



Maamora - Morocco

Component 1: Production of data and tools to support decision making relating to the vulnerability of Mediterranean forest ecosystems to climate change impacts and their adapting capacities

To assess vulnerability of forest ecosystems to climate change in pilot sites, two approaches are proposed:

- Production of cartographic material on the evolution of forest cover, land uses and climatic conditions of the pilot sites (VITO-Vision on Technology)
- Multifactorial spatial analysis of ecosystem vulnerability to climate change (GIZ Tunisia)

(Approaches approved by country partners that selected national experts to be trained on the proposed methodology)

Production of cartographic material on the evolution of forest cover, land uses and climatic condition of the pilot sites (VITO-Vision on Technology)

Assessing the current status (and current dynamic) of the land cover of five pilot sites selected for the implementation of component 1 using:

1. Biophysical and climatic data

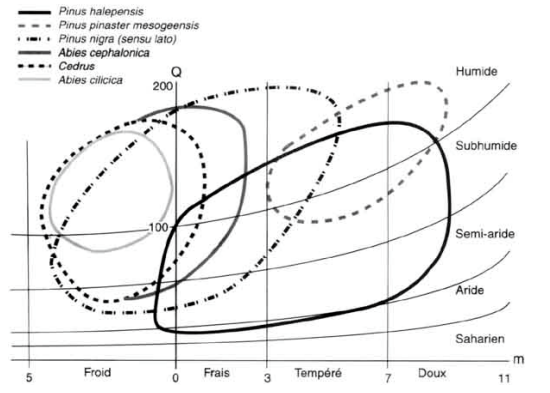
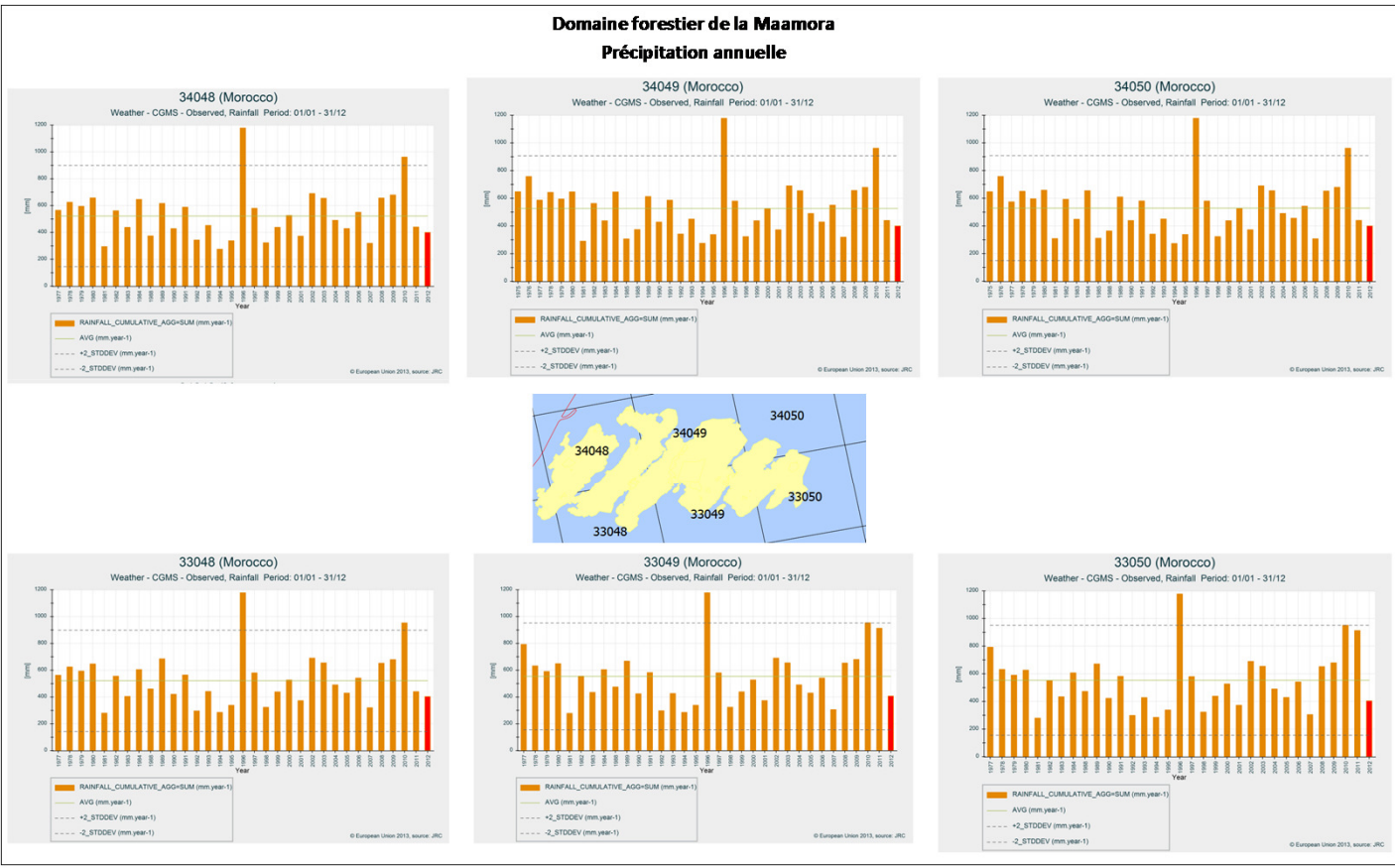
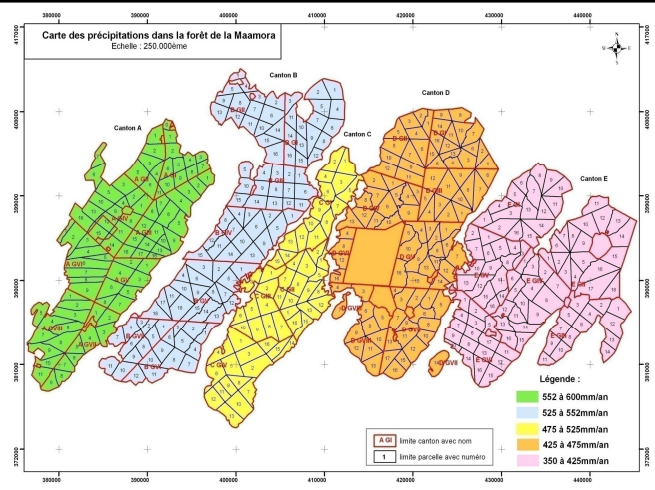
2. Land use changes in the pilot sites

- Land use maps of the pilot sites (1990/2000/2010/2014) ;
- Forest cover maps and other non wooded land maps (1990/2000/2010/2014) ;
- Species range maps of the most characteristic species (1990/2000/2010/2013)
- Historical data on forest management in the pilot sites
- Forest management plans applied during the past fifteen/twenty years (useful for understanding of climate change impacts and elaboration of baselines for REDD+) ;
- Identification of extreme/exceptional climatic and biophysical events during the past fifteen/twenty years (useful for understanding of climate change impacts and *elaboration of baselines for REDD+*) ;

3. Socio-economic data on the pilot sites

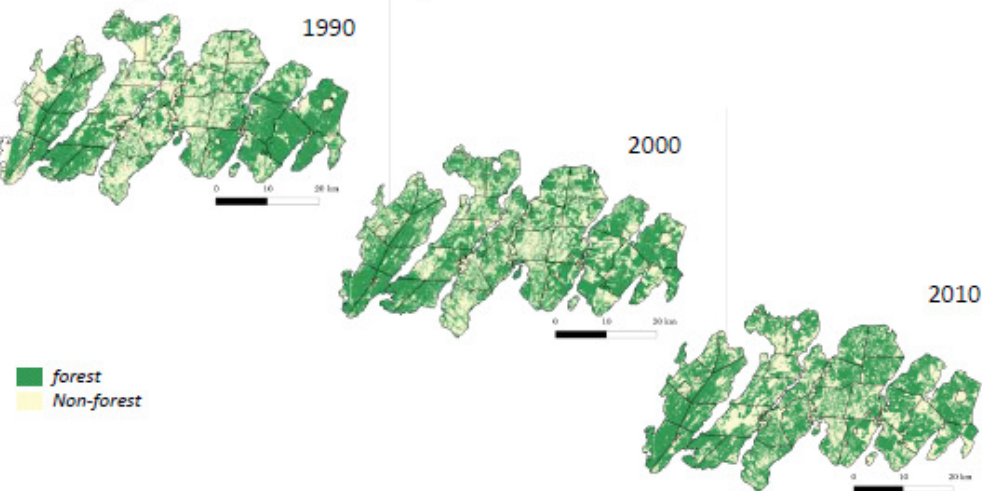
Production of cartographic material on the evolution of forest cover, land uses and climatic condition of the pilot sites (VITO-Vision on Technology)

- Analysis of climatic data (precipitation and temperature) to assess variations during the last decades
- Emberger's pluviometric quotient (Q)
- Agriculture Stress Index System (ASIS)

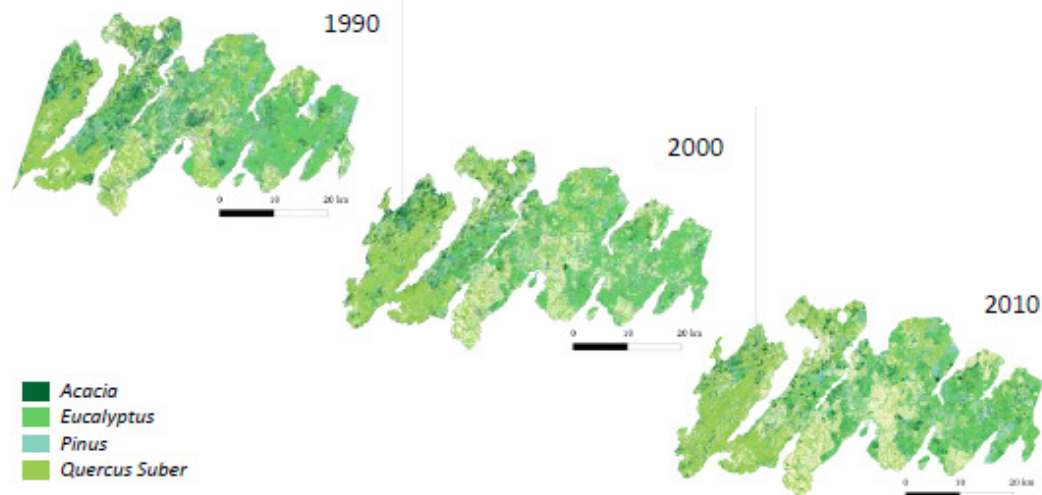


Example of the evolution of Maamora forest (Morocco) from 1990 to 2010

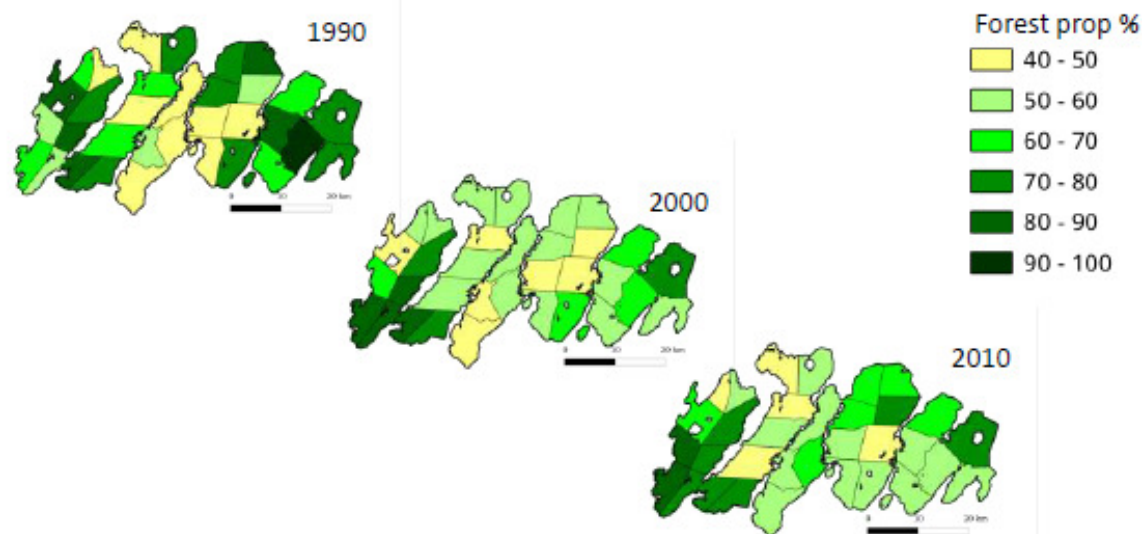
- classify forest in all reference years



- classify forest types in all reference years

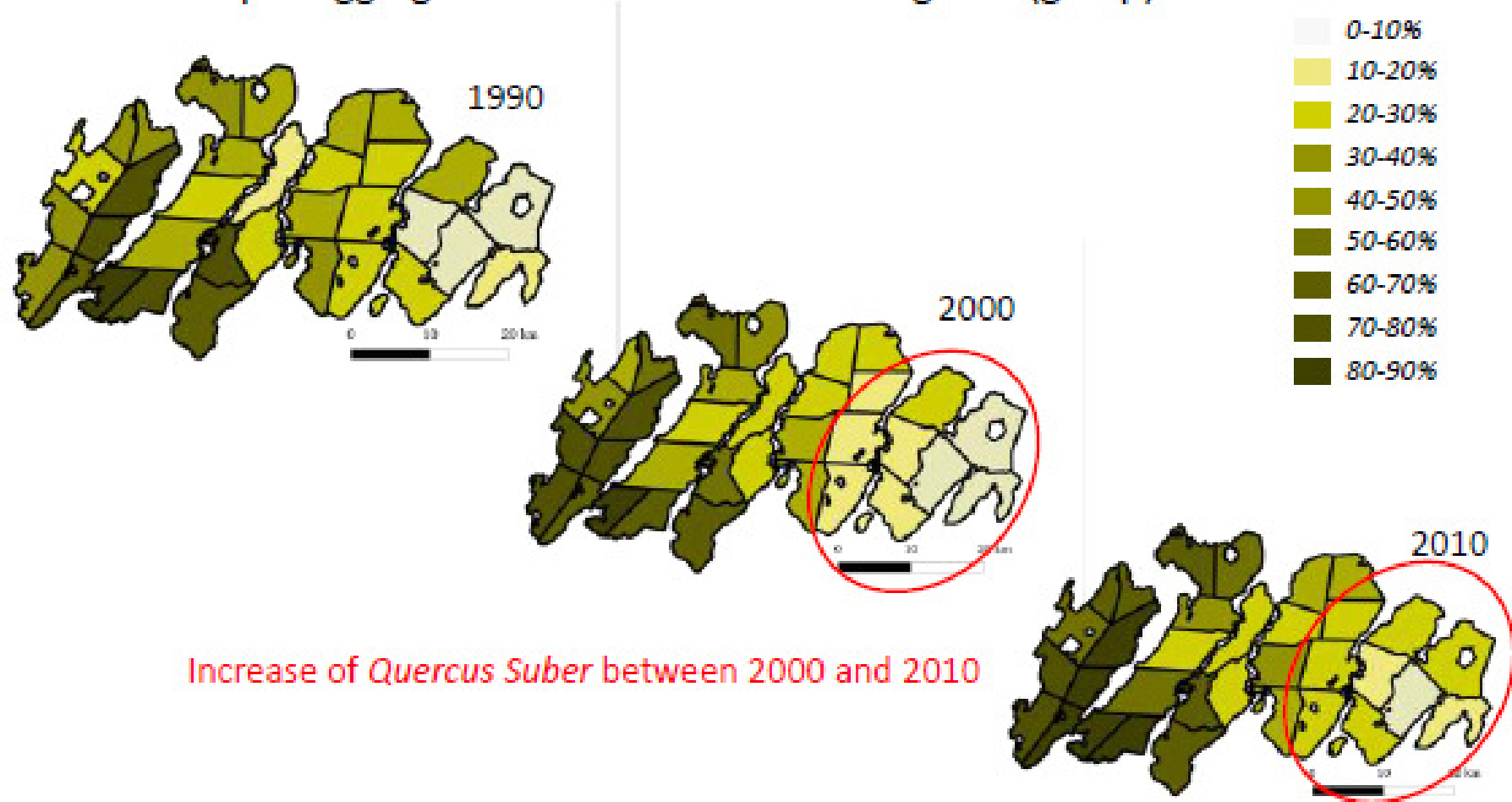


- aggregate to administrative regions to report forest dynamics



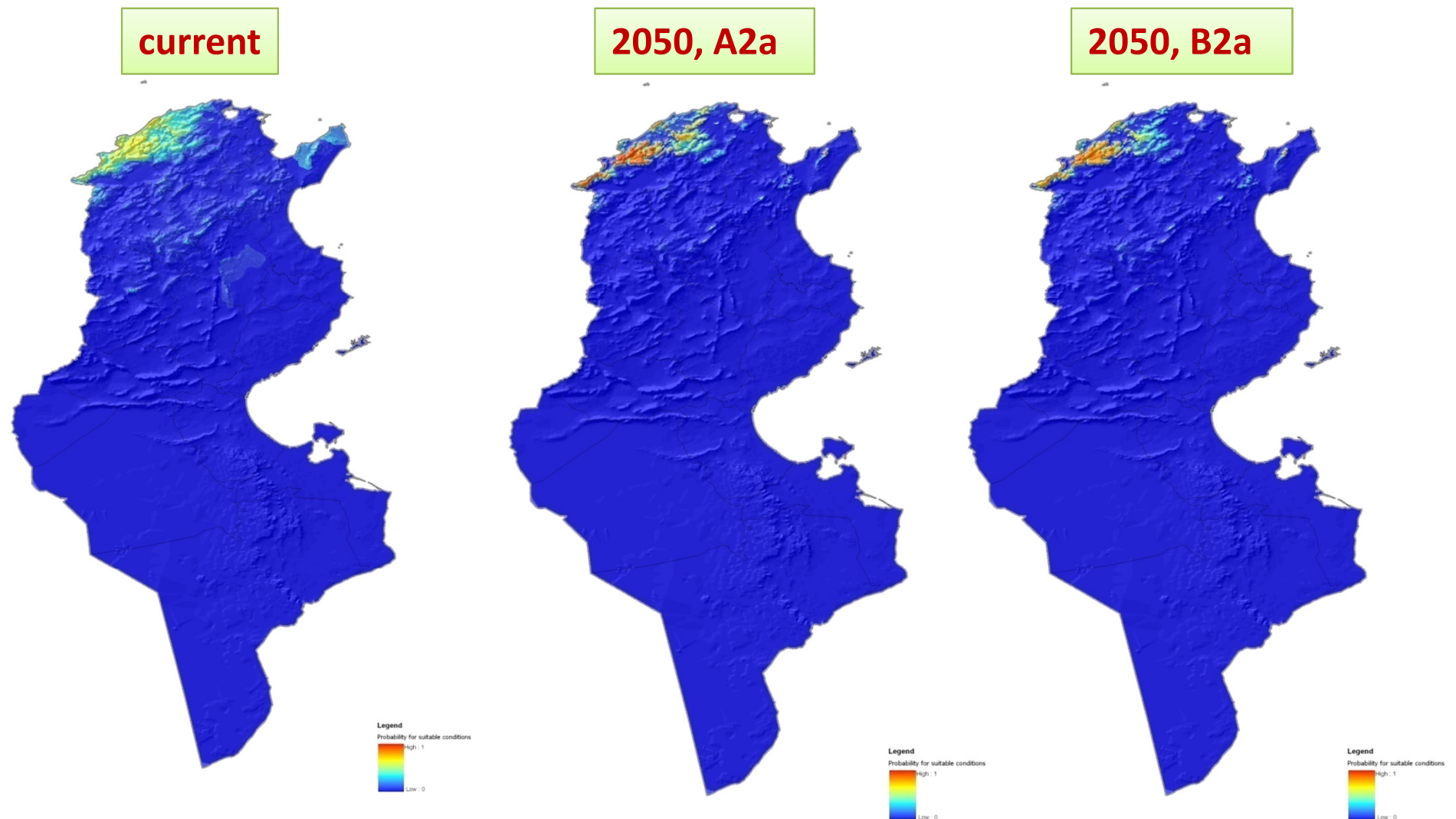
Example of the evolution of Maamora forest (Morocco) from 1990 to 2010

- Example: aggregation of *Quercus Suber* at regional (group) level



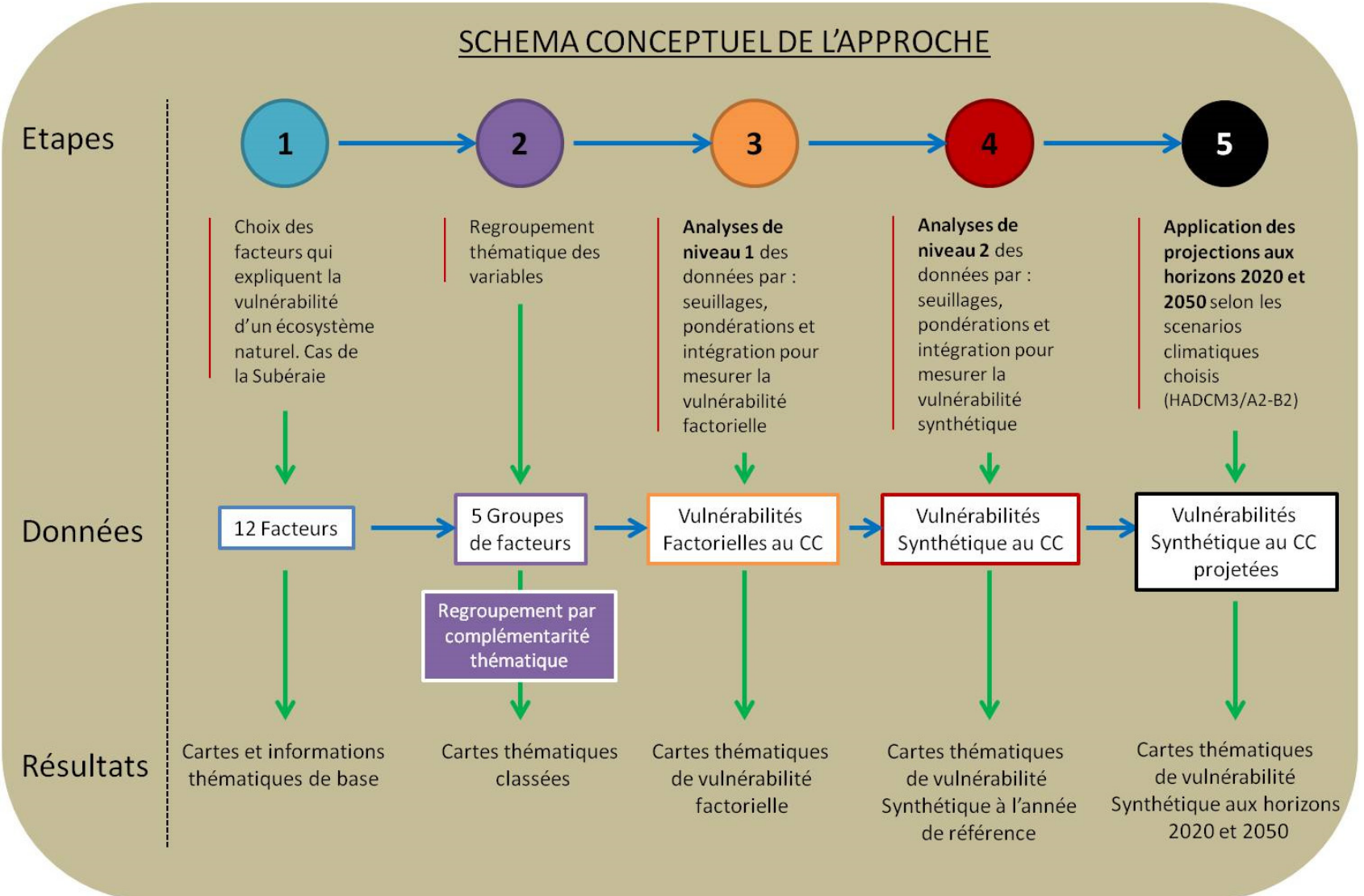
Multifactorial spatial analysis of ecosystem vulnerability to climate change (GIZ Tunisia)

Maps showing the probability of suitable conditions for **Cork oak** (*Quercus suber* L.) in Tunisia, with two IPCC emission scenarios: more suitable conditions with A2a scenario, fragmented distribution in 2050 (GIZ Tunisia, 2013)

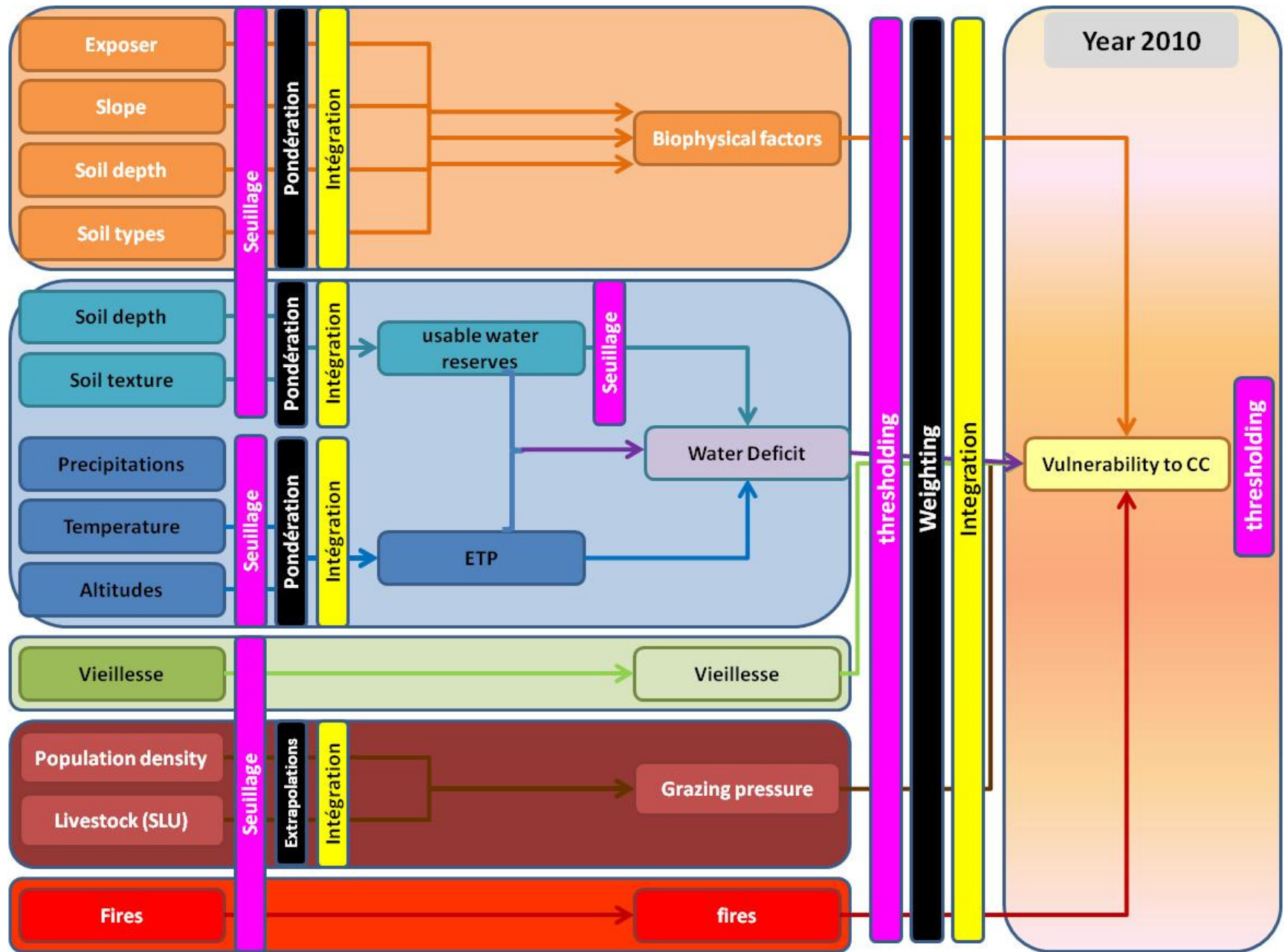


Multifactorial spatial analysis of ecosystem vulnerability to climate change (GIZ Tunisia)

1. Selection of factors that explain the vulnerability of a natural ecosystem;
2. Grouping variables by thematic;
3. Data analysis (level 1) by: thresholding, weighting, integration to assess the vulnerability of each factor;
4. Data analysis (level 2) by: thresholding, weighting, and integration to assess the global vulnerability;
5. Application of the projected data according to the selected scenarios (A2-B2).



Multifactorial spatial analysis of ecosystem vulnerability to climate change (GIZ Tunisia)

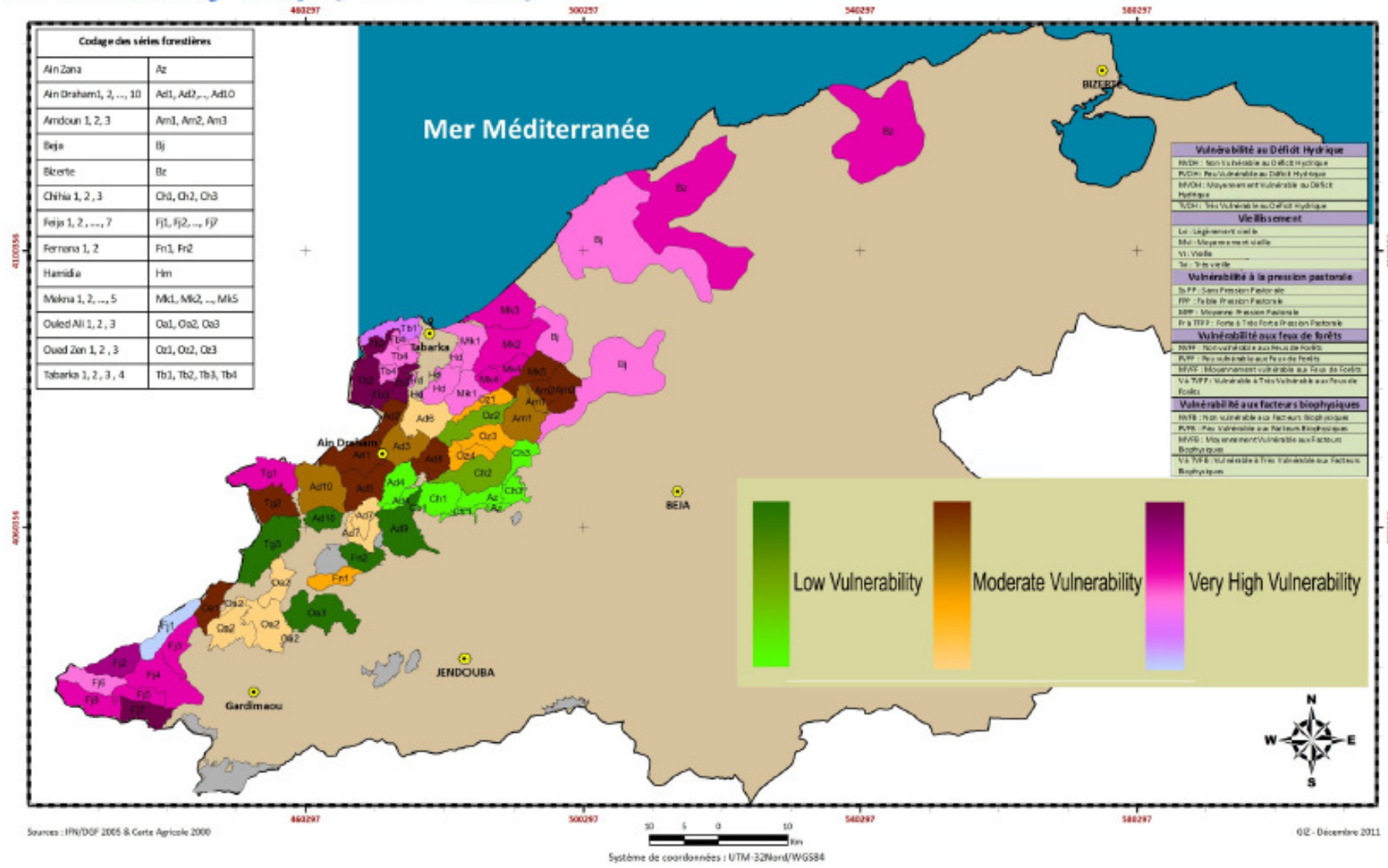


Multifactorial spatial analysis of ecosystem vulnerability to climate change (GIZ Tunisia)



Vulnerability analysis of Cork Oak Forests to Climate Change in Tunisia

Vulnerability map (2050 – A2) Vulnerability map (2050 - A2) (All factors)



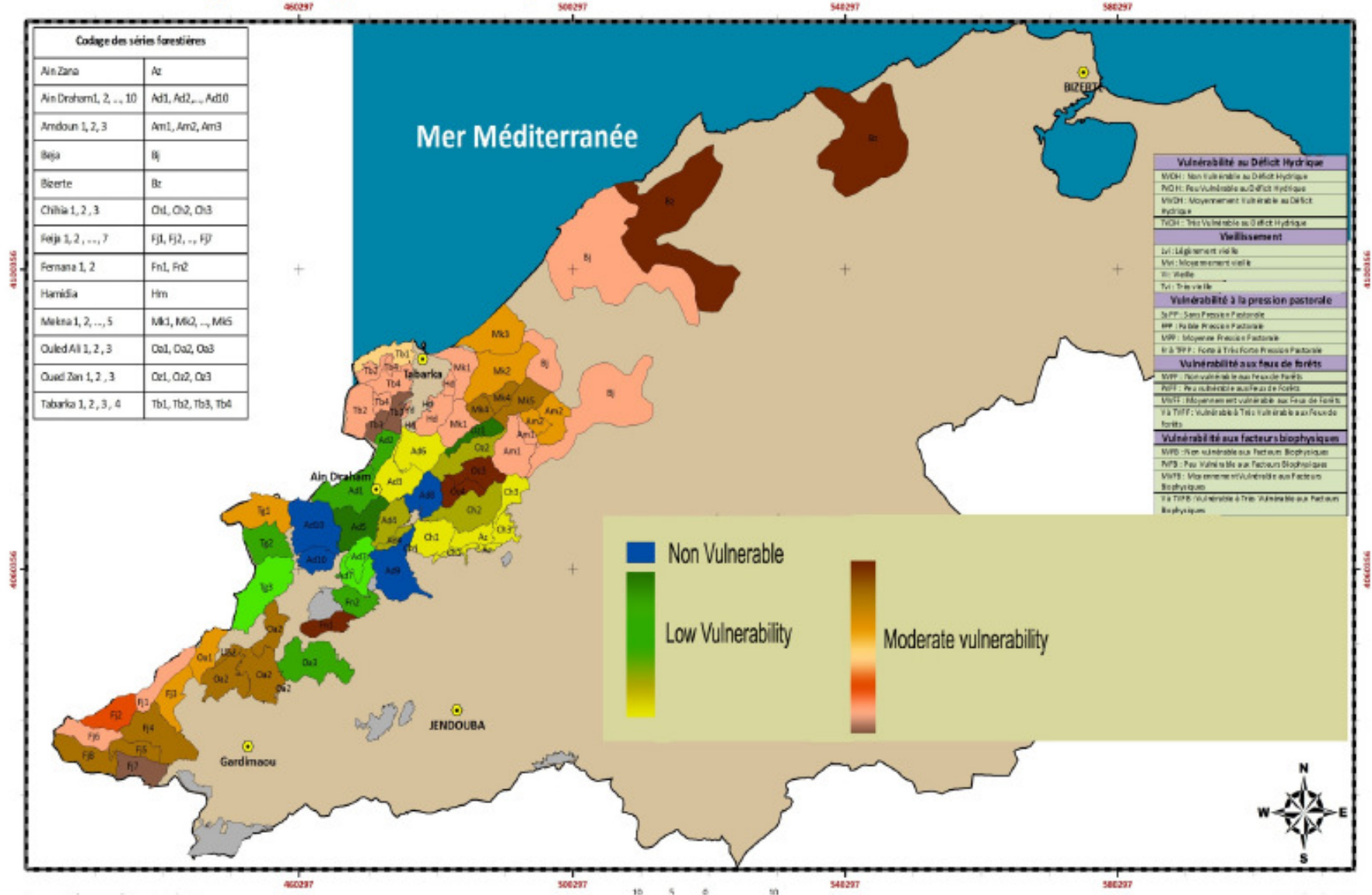
Multifactorial spatial analysis of ecosystem vulnerability to climate change (GIZ Tunisia)



Vulnerability analysis of Cork Oak Forests to Climate Change in Tunisia

Vulnerability map (2050 – B2)

Vulnerability map (2050 - B2) (All factors)

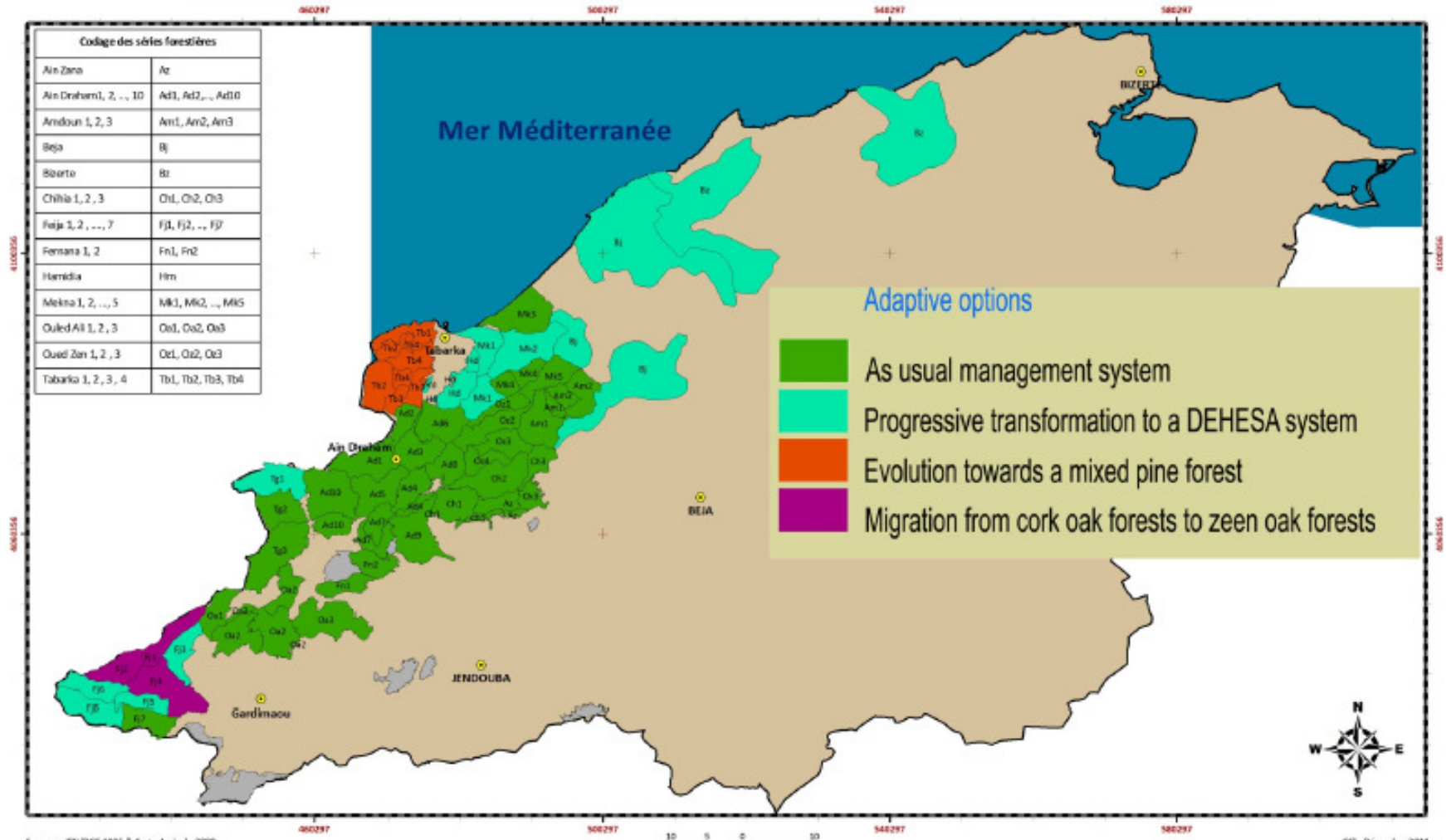


Multifactorial spatial analysis of ecosystem vulnerability to climate change (GIZ Tunisia)

Options for adaptation (2050 – A2)



Vulnerability analysis of Cork Oak Forests to Climate Change in Tunisia
Adaptive options map (2050 - A2)



Source: IFN/DGF 2015 & Carte Agricole 2000

Système de coordonnées : UTM-32Nord/WGS84

Component 4: Optimization and valorization of the mitigation potential of Mediterranean forests (carbon sinks) through the development of methodological tools to value local efforts of protection/restoration

1. Development of a methodology adapted to Mediterranean specificities in order to value the activities aiming at conserving and reinforcing the mitigation (carbon sink) function of Mediterranean forest ecosystems;
2. Implementation of the methodology in 5 pilot sites through projects aiming at conserving and reinforcing the mitigation function of Mediterranean forest ecosystems;
3. Regional workshop for outputs restitution on mitigation function and lessons sharing among countries.

Final Remarks

- All components of the project are based on scientific methodologies/approaches
- Collaboration with experts and researchers is mandatory for this kind of multidisciplinary projects, but
- The main challenges are:
 - Identify the appropriate experts to be consulted
 - Identify the appropriate methodology depending on the selected ecosystem
 - Identify a methodology that can be applied to different pilot sites/countries (depending on data availability, level of expertise of local partners)
 - Identify the correct way to transfer knowledge to country partners
 - Identify the correct way to incorporate scientific results as a part of management measures (forest or landscape level) and policies
 - Identify the correct way to disseminate and transfer the results to managers and policy makers

Final Remarks

- Future needs may be:
 - Spread scientific results outside “scientific community” to facilitate the identification of experts by managers and policy makers
 - Improve the link between research and forest management/policies (need to highlight the possibility of applying the results of scientific research at different scale levels)
 - Improve studies in developing countries where
 - the effect of climate change is nowadays evident
 - assisted migration may be a solution for observed or expected population losses
 - expected future changes in European forest species are already occurring