IMPETUS WEST AFRICA

P16

IMPETUS Cooperation with Local Partners
The Moroccan Case

Introduction:
IMPETUS is funded by German Institutions (Ministries). Nevertheless, this does not mean that IMPETUS executes German research in Morocco, but integrated bi-national research on sustainable use of water resources. From the start of the project on, IMPETUS established three different axes of collaboration. Sound scientific collaboration and concerted fieldwork with academic institutions, data exchange and joint development of management tools with governmental authorities, and know-how transfer and technical collaboration with local communities. This poster displays some aspects of IMPETUS networking in Morocco.

Outlook:
IMPETUS will strengthen the Moroccan academic capacities for earth system analysis, especially in modelling approaches for dynamic systems. IMPETUS will enhance the institutional know-how of Moroccan authorities to handle models and expert systems for resource management. Finally, IMPETUS will increase the local and regional awareness of the fragility of natural resources and transfer know-how to local communities to adapt their traditional land use systems to a world with limited resources and changing socioeconomic systems.

Local Cooperation

PHASE 1

Community integration at IMPETUS testsites

Fig.1 Installation of test site Iriki. The team includes the future warden Abderrahman El Hamidi

The decision of IMPETUS-Morocco to set up a test site transect along the principal climatic gradient made it necessary to install meteorological stations and fencing experiments in ten different villages. To assure the success of the experiments we intended from the beginning to establish reliable relations with local communities.Therefore, apart from permits of the national authorities, we looked for the approval of local communities to install test sites and included local representatives in the site selection. Test sites were always set up together with local workers to establish personal relationships between the IMPETUS-team and the community. During this phase a local test site warden with half time employment was chosen who acts as facilitator between IMPETUS and the community, explains the project's intentions to sedentary and mobile people and helps with sampling procedures and test site maintenance. Apart from this, rural test site communities profit from accommodation and casual jobs as field assistants. The participatory approach for test site installation and management prevented so far damages caused by vandalism and succeeded in establishing a research environment based on mutual respect and confidence.

PHASE 2

Integration of local and regional staff in research activities

Fig.4 Local interpreter Redouan Oumouch (center) during a field interview at Taoujgalt

Collaboration and cooperation with Moroccan counterparts is not only established on the formalised academic level, but also on the level of local co-workers. Most German colleagues who stay in the field for longer periods have established working relationships with local assistants who profit in various ways from the assignments. Of course, there is the financial benefit, but also the aspect of capacity building and professional training. It starts with local assistants of the anthropologists who, in exchange for their information, receive knowledge about the foreign researchers and their world, ideas and experiences. They often introduce this knowledge into their community, and might become multipliers for innovations. The second level is that of the technical assistants and interpreters, who acquire new technical or administrative skills. The most important level is that of research assistants. They are efficiently trained to carry out interviews and surveys independently, under supervision of the researchers. For this purpose, local intellectuals like school teachers were recruited. They possess the educational background and a profound knowledge so that they can contribute a Moroccan focus to the studies of the local society.

PHASE 3

Knowledge transfer to local resource management initiatives

Impetus originally started with basic research on the hydrological cycle, water distribution and water usage in the Drâa-Catchment. The challenge for the third phase is to translate our acquired awareness of natural and social systems into recommendations feasible for rural communities. This knowledge transfer should include the elaboration of training modules regarding different topics: (drinking and irrigation water quality and quantity, dynamics and management of pastoral resources, etc.). In addition, project know how should be integrated into communal planning. As a long tradition of collective resource management exists in the Drâa area, the identification and integration of local stakeholders into the planning processes is indispensable. Therefore a special focus has to be put on transparent planning processes and participative stakeholder integration. Existing NGO's like the *Associations d'Utilisation d'Eau Agricole* (AUEA) could be important counterparts in the rural areas to implement science based management tools. An exemplary case study should be initiated and accompanied along with national or international institutions of the technical cooperation.

Fig.7 Traditional irrigation system at Ameskar

Governmental Level

Institutional Cooperation Scheme

Moroccan Authorities

- Office Régionale de Mise en Valeur Agricole de Ouarzazate (ORMVAO)
- DIRECTION EL LA MÉTÉOROLOGIE NATIONALE (DMN)
- DIRECTION GÉNÉRALE DE L'HYDRAULIQUE (DGH)

Acadamic Counterparts

- UNIVERSITÉ MOHAMMED V, Rabat – Faculté des Lettres et des Sciences Humaines
- UNIVERSITÉ IBNOU ZOHR, Agadir – Faculté des Lettres & Sciences Humaines
- Institut Agronomique et Vétérinaire Hassan II – Département d'Écologie Végétale

NGO's and regional Projects

- Réseau d'Observatoires de Surveillance Ecologique à Long Terme
- ADEDRA – Association de Developpement de la Vallée du Dra
- CONSERVATION DE LA BIODIVERSITE PAR LA TRANSHUMANCE DANS LE VERSANT SUD DU HAUT ATLAS (CBTHA)

Stakeholder integration (Comité de Pilotage)

To achieve the goal of sustainable water management, it is crucial to adjust the Moroccan institutional perception of social, political and natural issues with the external Analysis of the Moroccan reality IMPETUS is providing. Therefore, in addition to the scientific cooperation with academic counterparts, IMPETUS integrates Moroccan institutions in charge of resource management. Representatives of relevant authorities and NGOs were invited to form a consultative committee (Comité de Pilotage) together with German project members. Currently, the committee contributes knowledge about Moroccan policies and development strategies to the scenarios developed by IMPETUS. Additionally the committee assesses the problem clusters according to their relevance for resource management. One of the important future function of the committee will be the joint development of tools for resource management and the adaptation of existing tools and models to the necessities of Moroccan Institutions and stakeholders. A working plan for the committee is currently in preparation.

Fig. 5 Meeting of the Comité de Pilotage in Rabat (left to right: M. Touji, A. Lahmouri, U. Gehlen, B. Reichert, M. Jaafer, A. Leghtas, M. Kourdi, M. Finckh, A. Karimi)

MarIMPACT – a Decision Support System (DSS) for Resource Management

Fig.8 Barrage for the irrigation of oasis Tinzouline

Quantitative modelling tools are required to assess the impact of changing institutional, economic, socio-economic and resource based conditions. An example for such a tool is MarIMPACT (Maroc Integrated Modelling System for Policy Analysis, Climate and Technology Change), a socio-economic decision support system for resource management. It analyses interdependencies between resource availability (particularly water), socio-economic and demographic development and provides scenarios for the year 2020.The core of MarIMPACT is an hydro-logic-economic optimization model for the Drâa river basin It focuses mainly on the agricultural sector as the main water consumer in the region, but it also takes into account water demand for households/industry (including tourism) and hydropower generation. The water distribution is calculated by the model in order to maximise the economic benefits of the different users. One of the main purposes of the model is to provide ORMVAO with information about the impact of declining water availability and demographic changes on the agricultural sector (above all farm income) and to provide strategies for an optimal water allocation under water shortage including examples for alternative cropping patterns. Furthermore, alternative policy options can be analysed with the model, as for instance alternative water allocation and pricing policies.

Scientific Collaboration

Scientific networking with Moroccan research partners

From the beginning of the project on it was evident that effective research in Morocco could not be carried out without the cooperation with local partners. By using existing contacts with Moroccan scientific and administrative institutions, cooperation agreements were signed. Nevertheless, the majority of the cooperation with Moroccan academics is established on a lower hierarchical level, between IMPETUS subprojects and research groups on the Moroccan side. The most effective cooperation is the practical fieldwork, when Moroccan and German researchers work along the same questions or in the same regional context. Outstanding in this context is the funding of, and collaboration with Moroccan students. Examples for these approaches are the common field campaigns of botanists from the B3 subproject and the Institut Agronomique et Vétérinaire and an integrated fieldwork with Agadir and Rabat universities and members of the anthropological subproject B5. In the latter case, in 2002 and 2004 eight, respectively ten, Moroccan students were working in the Drâa-catchment to collect data for a comparative work and their own thesis (Maîtrise).

Fig.3 Professor Ait Hamza at 1st IMPETUS Symposium at Ouarzazate (Spring 2002)

Joint Research on Landuse Processes and Vegetation Degradation

Integrated German Moroccan research teams are essential for a successful analysis of land use patterns. IMPETUS subproject B3, together with its counterparts from Institut Agronomique et Vétérinaire, analyses the vegetation dynamics in the valleys of the Mgoun Atlas. The German research team focuses on monitoring plots under different land use and on biomass modelling. The Moroccan partners evaluate the human impact on the steppe ecosystems by firewood harvesting. Moroccan and German scientists cooperate closely during field work. Joint data analysis and processing leads to an integral understanding of land use processes. Spatio-temporal data on biomass harvesting and vegetation dynamics serve as input parameter for biomass modelling and scenario evaluation with the SAVANNA model. Fig.5 shows the firewood collection areas of three different village assemblages in the Atlas valley of Taoujgalt-Alemdoun. Wood constitutes the principal energy source for the local population. Biomass harvesting is a function of population size and available gathering zones. The gathering of firewood thus has a major effect on the species composition in these steppe ecosystems, especially around large villages with small territories.

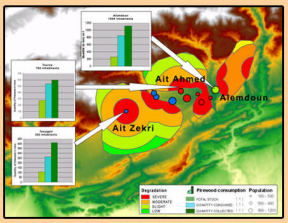

Fig.6: Degradation Analysis at Taoujgalt Valley

Outlook on future scientific cooperation

IMPETUS so far established an interdisciplinary research infrastructure unique for global change studies in Northern Africa. Along the IMPETUS transect 13 climate stations and 38 permanent monitoring plots are continuously recording data on climate and vegetation in order to observe the environmental fluctuations on the northern margin of the Sahara. As monitoring data gains value with increasing length of time series, IMPETUS is looking for institutional solutions to guarantee the continuity of this monitoring approach. In the case of the monitoring plots, the vegetation ecology group has the intention to incorporate the IMPETUS transect in a international Biodiversity Monitoring Network. Access to biodiversity data for the scientific community will be facilitated via the GBIF portal. The climate research group in charge of the weather stations is looking for similar institutional solutions on a Moroccan or international level. Hydrological, meteorological, agronomic and economic models will be implemented in the respective Moroccan counterpart institutions. The implementation of a web based GIS service will serve for continuous data exchange and, according to the IMPETUS data exchange protocol, facilitate data access to the scientific community.

Fig.9 Weather station at testsite Iriki

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