ICARDA
Science for Better Livelihoods in Dry Areas

ARAB FUND FOR
ECONOMIC
& SOCIAL DEVELOPMENT

PROJECT

Sustainability and Operationalization of Established Regional Agricultural Research Centers in Five Arab Countries

SUB-PROJECT

RESTORATION OF BADIA ECOSYSTEM SERVICES FOR ENHANCED COMMUNITY LIVELIHOOD.

BUS 200205, 2017.

ACTIVITY A6:

DEVELOP METHODS FOR INTEGRATED ASSESSMENT OF RESTORATION INTERVENTIONS (IMPACT ON SOIL AND ECOSYSTEM FUNCTIONS) AT BADIA SCALE AND AT EXPERIMENTAL SITE SCALE.

An Activity led by CLAUDIO ZUCCA, PhD

Progress report 2017

Deliverable N. 1-2017.

"Summarized review of the recent rangeland restoration policies and programs conducted in Jordanian Badia"

LEAD AUTHOR:
Claudio Zucca[1]

SUGGESTED CITATION:
Zucca C., Bartolini P. (2017). Summarized review of the recent rangeland restoration policies and programs conducted in Jordanian Badia. Technical report. "Sustainability and Operationalization of Established Regional Agricultural Research Centers in Five Arab Countries" Project. International Center for Agricultural Research in Dry Areas (ICARDA). Rabat, Morocco.

DISCLAIMER

[1] International Center for Agricultural Research in Dry Areas (ICARDA). Rabat, Morocco.

INDEX

Foreword

This research activity titled "ACTIVITY A6: DEVELOP METHODS FOR INTEGRATED ASSESSMENT OF RESTORATION INTERVENTIONS (IMPACT ON SOIL AND ECOSYSTEM FUNCTIONS) AT BADIA SCALE AND AT EXPERIMENTAL SITE SCALE" was funded as part of the Project titled "Sustainability and Operationalization of Established Regional Agricultural Research Centers in Five Arab Countries" (sub-project "Restoration of Badia ecosystem services for enhanced community livelihood"), granted by the Arab Fund for Economic & Social Development (AFESD) and implemented by ICARDA.

This research was started in the last quarter of 2016 as a response to the perceived need to launch interdisciplinary research to identify approaches to enhance the effectiveness of the on-going efforts to mitigate land degradation in Badia and to restore rangeland productivity. The goal of this specific activity is to evaluate methods to enable an evaluation of the impacts of the interventions conducted so far.

This report summarizes the work done during 2017 to review the relevant policies, programs, and interventions implemented during the recent decades in Badia, as part of Activity A6.

Activity Leader: Claudio Zucca

Cooperating Scientists: Pietro Bartolini[1]

[1]University of Florence, Italy.

Aknowledgment:

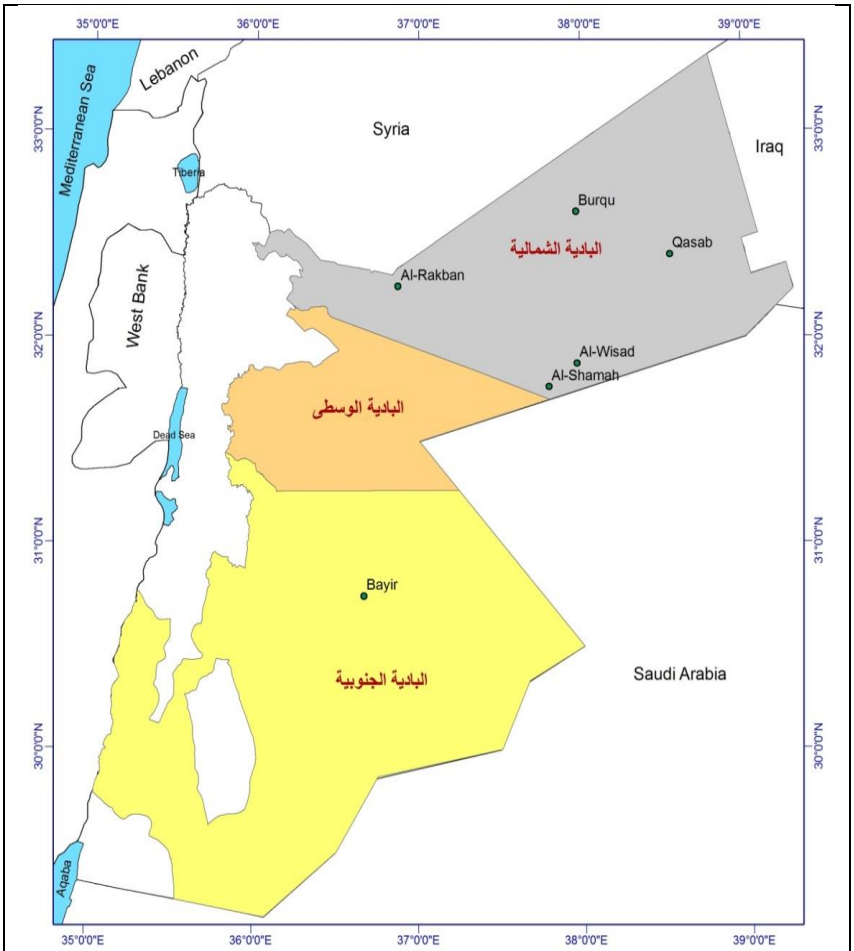
The activity was supported by the Research Collaboration Agreement between the International Center for Agricultural Research in the Dry Areas and the Department of Agricultural, Food and Forestry Systems of the University of Florence, within the CGIAR Research Program on Integrated Agricultural Production Systems for the Poor and Vulnerable in Dry Areas (CRP 1.1).

1. Introduction

The Central and West Asia and North Africa (CWANA) region encompasses large areas of arid and semi-arid zones. These are areas where rainfall, relative to the level of evapotranspiration, is inadequate to sustain reliable crop production. Most of the arid and semi-arid zones of the CWANA region are rangelands and are characterized by wide variability in rainfall and temperature, and frequent droughts.

The so called “Badia” region of Jordan is characterized by arid rangelands and deserts which cover about 80% of the country area and extend to the south and to east in continuity with the Saudi and Iraqi steppes and deserts, as shown by the figure below. It is characterized by hot-dry summers and cold-dry winters, and by an average annual rainfall of 50 to 200 mm with high interannual variability. It presents elevations between 700 and 1,100 meters above sea level.

The increased demand for meat in the region has driven an increase in livestock numbers, particularly the number of sheep and goat witnessed a continuous increase since 1990. In Jordan the 24-year average since 1990 was 2.742 million heads, fluctuating due to many events and factors that affected Jordan including the Gulf war, the devaluation of the Jordanian dinar, the waves of droughts that hit Jordan and the changes in the government policies (MOE – IUCN – GEF, 2015). This process has also led to changes in herding systems. It is estimated that only 2% of livestock herders in Jordan Badia are still nomadic, and that 80% of them own a truck, tractor, or car (Davies et al., 2010). Increasing cultivation (e.g., barley) by bringing into production lands from steppe and desert rangelands that may not be suited to cropping. The increase in grazing pressure and cultivation of traditional and fragile grazing lands has led to severe degradation of these resources. Consequently, the region is either affected or severely threatened by desertification (MOE, 2015). The new plan to combat desertification in Jordan (MOE, 2015) reported that the rangelands in Jordan provided over the last 24 years a sum of JD404 million in terms of direct saved costs of animal feed evaluated at the prices of 2013, and stated that continuing the current practices without any new measures/projects will result in huge economic losses that may even exceed hundreds of million dinars.



The administrative boundaries of Jordan Badia (BRP, 2012).

2. Recent rangeland restoration policies and programs conducted in Jordanian Badia

During the recent decades national and international institutions put in action several policies and programs to restore the degraded rangelands of Jordanian Badia. Considerable investments have been made among which the recent Badia Restoration program (BRP), established in 2008, is the most important. The following two sections summarize the main ones, with particular focus on the policies (section 2.1) and to large-scale restoration interventions (section 2.2).

It has to be noted that due to the relatively limited public documentation available about the actual achievements of these programs, in many cases it was not possible to identify, not even qualitatively, the interventions actually promoted by such policies in Badia, and their impacts. Personal contacts with officers of various Ministries did not help to find more written information.

2.1. National policies and programs relevant to rangeland degradation and restoration

Pre-National Strategy period. Between 1950 and 1969, a series of interventions took place in Jordan, put in action by the Ministry of Agriculture and the Royal Jordanian Army. They made anti-erosion stony structures, dune fixation interventions, wells, water tanks, and other water harvesting infrastructures, some of which still visible and operational today. These interventions were not integrated in an overall strategy, but their value and quality is still recognized by local experts. This intervention phase ended in 1970.

The **National Environmental Strategy** (NES). The first environmental strategy in Jordan (NES) was developed in 1991, as a response to the World Conservation Strategy formulated by IUCN, UNEP and WWF in 1980 (Ministry of Planning & International Cooperation, 2017). NES catalogued all environmental problems and pressure factors and contained more than 400 specific recommendations and suggested actions in the field of environmental protection and conservation (Ministry of Agriculture, 2013). The NES did not set clear priorities and Jordan regional governments allocated budget to several environmental initiatives achieving an overall limited impact. However, the NES recommendations about agriculture and land management, water resources, wildlife habitats, coastal areas and marine environment and energy, still represent a useful baseline for the development of future policies (Ministry of Planning & International Cooperation, 2017).

National Environmental Action Plan (NEAP). The NEAP was a practical environmental guidebook developed in 1995. It provided a comprehensive assessment of environmental problems and remediation opportunities in Jordan, combined with a prioritized and phased plan of action for addressing the issues. The NEAP identified 41 environmental priorities needs, focusing on a shortlist of 19, clustered in four projects (Development of a national land use planning/zoning system; Management of agricultural plastic waste; Preservation of forest land; Urban and regional land use planning). NEAP interventions were reported as almost entirely implemented (Ministry of Planning & International Cooperation, 2017).

National Agenda 21. Agenda 21 was a multi sectorial national strategy for sustainable development launched in 2000 with technical and financial support from UNDP. For combating desertification, the National Agenda 21 proposed the following strategic objectives (Ministry of Planning & International Cooperation, 2017):

- Developing a methodology for addressing and mapping the dynamics of desertification, and the processes and hazards in each ecological zone in Jordan;

- Determine priority areas;
- Diversifying the income of people to mitigate poverty and reduce pressure on land resources;
- Adopting sustainable land use plans and sustainable management of the water resources with the aid of remote sensing and GIS.

Regarding rangeland development, the following objectives were proposed:

- Increasing the productivity and improving the management of rangelands on a sustainable basis;
- Strengthening capacity building by setting-up appropriate training, planning and management units, a research unit and improving capacities of human resources;
- Ensuring a sustainable utilization of the forest and range resources by the design and implementation of rational management systems.

National Strategy for Agricultural Development (NSAD). The NSAD was prepared by the Consultative Economic Council in 2002 for the decade 2000-2010. The strategy stressed on sustainable agriculture and protection of natural resources. The strategic and operational programmes were comprehensive and covered most issues of biodiversity conservation, sustainable resource use and fight against desertification. NSAD organized clusters of activities in subsectors: rain fed agriculture, livestock and rangeland, irrigated agriculture in the Jordan valley, and irrigated agriculture in the highlands (Ministry of Planning & International Cooperation, 2017). The NSAD main themes were:

- Conservation of land, water and natural vegetation through sustainable utilization that ensures long-term agricultural production;
- Conservation of biodiversity in parallel to sustainable agricultural development;
- Improvement of the technical and managerial capabilities of the agricultural sector to cope with probable climate and environmental changes, and absorb their consequences;
- Halting unplanned expansion of urban areas on agricultural land;
- Combating desertification and protecting the environment, the agro-biodiversity and agricultural resources, to secure requirements for sustained development;
- Conservation of agricultural land by controlling soil erosion in steep mountainous areas, through improved agricultural practices and water conservation measures.

Jordan National Agenda. The Jordan National Agenda was a vast plan launched in 2006 and implemented until 2017, with a specific section for environmental sustainability. The objectives were:

- Survey and define criteria for desertification hazards and thus map areas accordingly;
- Establish a desertification monitoring system;
- Conducting socio-economic surveys in drought threatened areas;
- Establish other alternative livelihood measures that could provide incomes in drought prone areas and arid zones;
- Documenting traditional knowledge on soil protection measures and combating desertification (Ministry of Planning & International Cooperation, 2017).

National Strategy and Action Plan to Combat Desertification (NAP-2006). The Jordan NAP was launched in June 2006. The plan was coherent with the other major development plans thanks to the fact that its development was done in a participatory process including stakeholders involved in the other national planning processes (Ministry of Planning & International Cooperation, 2017). The NAP-2006 was organized in the following programs:

- Desertification Information System (DIS);
- Drought prediction and Desertification control;
- Capacity building and institutional development;
- Restoration of degraded ecosystems of rangelands and forests;
- Watershed management;
- Human, social and economic development initiatives.

NAP-2006 provided a framework for action to combat the accelerating threats of desertification in the country, however it concrete results are considered as limited (MOE – IUCN – GEF, 2015). The constraints limiting the achievements of NAP-2006 were mainly institutional and financial, and, as for the NES, the absence of a clear prioritization made it difficult to allocate resources. Furthermore NAP-2006 had no monitoring and evaluation plan to assess the progress of the different activities (MOE – IUCN – GEF, 2015).

The **Aligned National Plan to Combat Desertification in Jordan** (NAP). The Aligned NAP of Jordan is the extension of NAP-2006. It has been developed for the years 2015-2020 to counterbalance the lack of practical results of the NAP-2006. Its goal is: “Productive

and sustainable use and management of land resources to support poverty reduction, environmental sustainability and national economy". The Plan has five operational objectives, aligned with the strategic objectives of United Nations Convention to Combat Desertification (UNCCD) 10-years strategy:

- Actively influence relevant national and local processes and actors to adequately address desertification/land degradation and drought related issues;
- Develop an enabling environment for solutions to combat desertification/land degradation and mitigate the effects of drought;
- Strengthen the collection and use of scientific evidence and knowledge on desertification, land degradation and mitigation of the effects of drought;
- Build capacity to prevent and reverse desertification/land degradation and mitigate the effects of drought and to enable sustainable land and ecosystem management;
- Increased mobilization and improved coordination of national and external financial and technological resources.

The Aligned NAP is more structured than the previous one, with stronger emphasis on the relations among stakeholders, better financing and supported by a clear monitoring and evaluation plan. Its main goal was raising awareness about desertification, land degradation and drought among the stakeholders, generate partnerships, and coordinate the efforts of the different policies, programs, and subjects involved (MOE – IUCN – GEF 2015).

2.2. Large-scale restoration interventions

National Programme for Rangeland Rehabilitation and Development (1999-2006). During the Gulf Crisis of 1990-91, Jordan ecosystem resulted severely affected by massive influx of refugees with their livestock, causing overgrazing and affecting the productivity of the entire Badia region. The National Programme for Rangeland Rehabilitation and Development was funded by IFAD as the first phase of a bigger plan to revert the decline in Jordanian rangeland resources, although the idea of a bigger plan was subsequently abandoned (IFAD 2012). The overall goal was to re-establish the productive capacity of rangeland resources, contributing to environmental, social, cultural and economic development of the Badia region. The activities conducted at the national level included capacity building in generating the information and knowledge needed to develop strategies and policies for the sustainable improvement and use of the rangeland resources. At the local level, participatory rangeland restoration and management activities were implemented in five pilot sites in North-East and South Badia. The latter were mainly based on rotational control of grazing, fodder shrub plantation, and managed grazing on the plantation sites, a scheme still followed by the most recent interventions. The program had the following objectives:

- Establishment of a national pastoral resources information monitoring and evaluation unit;
- Training activities for farmers;
- Construction of water harvesting and conservation structures;
- Establishment of protected areas;
- Establishment of rangeland management groups;
- Development of plans for the sustainable management of the rangeland via participatory approach.

The programme achieved parts of its objectives. The first three were successfully completed and a limited number of protected areas were established. On the contrary, the development of the rangeland management groups and of plans for the sustainable management of the rangeland was not completed or not achieved, compromising the long-term sustainability of the programme (IFAD, 2012).

Badia Restoration Program (BRP). The BRP was established to face the same unresolved problem of the previous interventions. In February 2003 Jordan presented five claim to the United Nations Compensations Commission (UNCC), for remediation of damages caused by the various international crises affecting the region. One of them was for expenses of remediation and depletion of terrestrial resources. After reviewing these studies and necessary deliberations in June 2005, the Governing Council of the UNCC, awarded Jordan US $160,582,073 in compensation for the rehabilitation and restoration of Badia terrestrial ecosystem which was damaged due to the influx of refugees and their livestock (BRP, 2012). The awarding panel ruled that a cooperative rangeland management program is an effective approach that can provide adequate compensation for lost ecological services in Jordan. In its decision S/AC.26/Dec.258 (2005) the UNCC developed further guidelines and principles that had been considered in restoration and remediation activities planned in this CAP. In 2008 the Badia Restoration Program (BRP) has been established, with the Ministry of Environment as National Focal Point (NFP).

The actual implementation of BRP commenced in 2011 after furnishing a roadmap, a baseline study and conducting two workshops in Sept. 2010 with the participation of the local community and UNCC working group. Based on the outputs of the baseline study, workshops and roadmap recommendation, the BRP Management Unit (PMU) prepared a Community Action Plan for five years (old CAP). Nevertheless, the old CAP was approved by UNCC, as initial implementation of restoration of 2 years (2010/2011 & 2011/2012). A new CAP was then drafted to cover the period throughout 2025 (BRP, 2012). The main objectives of the BRP are:

- Reverse or mitigate damage occurred to the Badia terrestrial ecosystems with the full cooperation and participation of the Badia community;

- Restore biodiversity and productivity of land cover in the Badia as grazing resource.

The BRP Community Action Plan (BRP-CAP) is the operational component of the BRP. It defines the program specific objectives between 2011-2019 (old CAP 2011-2013 followed by+ new CAP 2013-2019):

- Identify and conduct most appropriate biophysical interventions and socioeconomic arrangements for restoring the degraded target watersheds in the Badia;
- Improve soil cover and livestock productivity in the target areas;
- Establish a sustainable ecosystem management and protection.

The program is divided in three main components:

- Integrated Watershed Management to restore degraded Badia terrestrial ecosystem;
- The socioeconomic incentives and community empowerment;
- Monitoring and evaluation (M&E).

The main interventions adopted for the Integrated Watershed Management component are micro and macro-catchment techniques. Micro-catchments are established along the contour lines, mainly according to the Vallerani Method (intermittent contour ridges), and associated with the plantation of drought tolerant fodder shrubs. The restored areas are protected after plantation by implementing a grazing rest or rotation/late grazing scheme. These techniques will last for few years, maintaining the vigor and productivity of the vegetation, reducing soil erosion and enhancing soil organic matter. After the rest, restored land will be given back to local communities (local stakeholders are organized in Cooperative and Consultative Community Councils) for sustainable management and exploitation. The project sustains a dialogue with local communities, which have a key role in implementing all the project activities starting from the selection of the sites of intervention. In addition to rangeland rehabilitation, the project provides livestock owners with vaccinations and other animal health assistance for their animals (BRP, 2012).

References

AFED/NCRD (2014). Report of the Arab Forum for Environment and Development – Enhancing Marginal Land Productivity in the Badia of Jordan. Amman, Jordan.

Akroush Samia, Dhehibi Boubaker (2015) Predicted Willingness of Farmers to Adopt Water Harvesting Technologies: A Case Study from the Jordanian Badia (Jordan). American-Eurasian J. Agric. & Environ. Sci., 15 (8): 1502-1513, 2015.

Ates S., Louhaichi M. (2012). Reflexions on agro-pastoralists in the WANA region: Challenges and future priorities. In: Acar Z. (ed.), López-Francos A. (ed.), Porqueddu C. (ed.). New approaches for grassland research in a context of climate and socio-economic changes. Zaragoza: CIHEAM, 2012. p. 511-516 (Options Méditerranéennes: Série A. Séminaires Méditerranéens; n. 102)

BRP (2012). Community Action Plan 2011-2025 (Revised). Technical Scientific Committee in Collaboration with BRP & National Focal Point. Amman, Jordan.

BRP, 2016. Cap projects, implementers and achievements. BRP Focal Point report. Unpublished.

College of Agriculture, New Mexico State University (2008), Preliminary Concept Paper On: Restoration of the Badia Rangelands and Increasing Income Opportunities for the Bedouin Communities by Utilizing Their Available Natural and Human Resources in Value-Added Activities. New Mexico.

Davies J., Niamir-Fuller M., Kerven C., Bauer K., 2010. Extensive livestock production in transition: the future of sustainable pastoralism. In H. Steinfeld, H.A. Mooney, F. Schneider, L.E. Neville, Livestock in a Changing Landscape, Volume 1: Drivers, Consequences, and Responses. Island Press. Washington. Pp. 285-308.

FAO, Mountain Partnership Secretariat, UNCCD, SDC, CDE (2011). Highlands and Drylands – Mountains, a source of resilience in arid regions. Published by FAO, UNCCD, Mountain Partnership, Swiss Agency for Development and Cooperation, and CDE, with the support of an international group of experts. Rome, Italy.

FAO/IFAD (2016), FAO's and IFAD's Engagement in Pastoral Development, Joint Evaluation Synthesis. Report No. 3909. Rome, Italy.

Gammoh I. A., Oweis T. Y. (2011), Contour Laser Guiding for the Mechanized “Vallerani” Micro-catchment Water Harvesting Systems. Journal of Environmental Science and Engineering, 5 (2011) 1309-1316.

IFAD (2012), Hashemite Kingdom of Jordan – National Programme for Rangeland Rehabilitation and Development - PROJECT PERFORMANCE ASSESSMENT. Report No. 2525-JO. Rome, Italy.

Ministry of Agriculture, Directorate of Rangelands and Badia Development (2013), Updated Rangeland Strategy for Jordan 2013/2014. Amman, Jordan.

Ministry of Planning & International Cooperation (2017), National Sustainable Development Report (2016/17), Desertification - Strategic planning frameworks for the protection and sustainable management of natural resources in deserts and areas affected by desertification, their integration into national development strategies and/or action plans. Amman, Hashemite Kingdom of Jordan

Available from: http://www.un.org/esa/agenda21/natlinfo/countr/jordan/desertification.pdf

Myint, M.M., & Westerberg, V. (2015). An economic valuation of a large-scale rangeland restoration project through the Hima system in Jordan. Report for the ELD Initiative by International Union for Conservation of Nature, Nairobi, Kenya. Available from: www.eld-initiative.org

MOA – IUCN (2015), Sustainably Investing in Rangelands – Jordan. Amman, Jordan.

MOA – MOE (2014), Badia Restoration Program (BRP) - Inception Report of the "Rehabilitation of Degraded Rangelands in the Badia" of the BRP-CAP. Amman, Jordan.

MOE (20xx). National Strategy and Action plan to Combat Desertification. Amman, Jordan.

MOE – IUCN – GEF (2015). The Aligned National Plan to Combat Desertification in Jordan – 2015/2020. Amman, Jordan.

University of Jordan (2015). 1st Progress Report of "Monitoring and Evaluation" Project of the BRP-CAP Projects, September-December 2014. Amman, Jordan