

Jordan – Dana Biosphere Reserve

Project title: Dana Biosphere Reserve

Partner institutions: The Royal Society for the Conservation of Nature (RSCN)

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Introduction

Dana Biosphere Reserve (BR) was established in 1993 with a relatively large area of 300 square km. It holds a relatively large representation of biodiversity. This biodiversity includes 833 species of plants which represent one-third of the country's plant species. Out of this number, three species were considered new to science. A total of 215 species of birds were recorded in

Dana BR which represent 50% of all the bird species in Jordan, and 38 species of mammals which also represent about 50% of the mammal species in the country. Moreover, Dana BR contains seven vegetation types of the thirteen vegetation types occurring in Jordan. These vegetation types support the existence of many plants, birds, and mammal species.

Dana BR is characterized by four main biogeographical zones. These zones are: the Mediterranean bio-geographical zone, the Irano-Turanian biogeographical zone, the Sudanian biogeographical zone and the Suharo Arabian biogeographical zone. These zones extend in altitude from 100 meter below sea level up to 1,500 meter above sea level.

A system of wadis and mountains mark the site, which extend from the top of the Rift Valley mountains down to the desert lowlands of Wadi Araba. It is truly a world of natural treasure. Through its integrated management approach and its ecotourism programmes, visitors to Dana BR start experiencing the beauty of Rumanah Mountain, the mystery of ancient archaeological ruins of Feynan, the timeless tranquility of Dana Village, and the grandeur of the red and white sandstone cliffs of Wadi Dana.

Dana BR offers a variety of services for visitors, including an information centre at the Tower entrance, a campsite at Rumanah, eight hiking trails, a visitor centre, a guest house at Dana village, and Feynan Eco-lodge. Dana Centre, Rumanah camp and Feynan eco-lodge were established in the reserve to provide the basis of ecotourism activities in the reserve and its buffer zone, which let the visitors to experience and enjoy the nature of Dana BR.

Dana Biosphere Reserve, through its innovative principles of management, links conservation needs with local communities needs through the creation of nature-based socio-economic programmes and facilities such as a fruit drying centre, a silver workshop, a leather tanning project and a candle-production workshop. This all enables Dana BR to become a paradigm for integrated ecosystem management of protected areas at the national and regional levels.

Justification

The conservation of natural habitats and the sustainable use of grazing resources in Dana BR is one of principal mandates of the Royal Society for the Conservation of Nature (RSCN), which requires a practical approach for dealing with pastoral communities using grazing resources of the reserve. The lack of reliable databases related to vegetation (coverage, diversity, biomass production...), grazing management (grazing capacity, grazing plans..), and livestock population in the areas surrounding Dana BR encouraged RSCN to think of conducting a series of studies to establish databases about biotic and abiotic components of the Dana BR ecosystems to halt land degradation and to develop a proper management plan for the biosphere reserve.

The pastoral communities used to exploit grazing resources of the Dana area before the establishment of Dana BR. Wintering of livestock in the Al Bara area had been practiced for many years to protect animals from cold weather conditions and to feed on the vegetation (ephemeral plants) especially for lactating animals. The sheep and goat flocks stay in Dana area during winter, spring and early summer before moving to the surrounding highlands to alleviate heat stress on animals during the summer season. The traditional “up-down” mobility of flocks

between lowlands of Dana area and adjoining mountainous areas maintained a reasonable coverage and composition of native vegetation.

Recently, the spread of farming activities (olive orchards, irrigated vegetable gardens and cultivation of field crops) in areas surrounding Dana BR created many problems to livestock producers, especially for landless pastoralists (nomads). Before 1995, feeds were subsidized which encouraged livestock owners to increase flock size substantially. The escalating number of grazing animals and continuous reduction of traditional grazing resource areas resulted in an increased pressure on grazing resources of Dana BR. The landless pastoralists were expelled from the areas surrounding the reserve and settled inside the reserve itself.

The “settlement” of some landless pastoralists inside the reserve resulted in continuous grazing and the destruction of the vegetation.

Besides updating databases, RSCN administration believes that effective involvement of the pastoral community in the development of grazing plans, and empowerment of community to implement the approved community work plans by community members themselves, with technical backstopping from RSCN when needed, will be the best solution for solving conflicts of grazing issues at Dana BR.

Achievements / lessons learned from the 1st Phase of SUMAMAD

Water and soil conservation

Work in the site concerning soil and water conservation was carried out in two parts: The first part related to monitoring of water resources and soils. The second part was concerned with concrete conservation programmes for soil and water.

(1) Water monitoring programme

A water monitoring programme has been established and was enhanced by using more accurate digital equipment that has been purchased thanks to the SUMAMAD project. The objectives were to find out (a) to what extent water quality is changing over time; and (b) to analyze overall water quality.

(2) Water management activities in orchards of Dana Village

Water of the three springs in Dana village is used to irrigate a total area of 40 hectares of fruit farms. The productivity of these farms is low because of the weakness of the present water management system. To overcome this problem, an effective water management system was established and implemented with the full cooperation of Dana Charitable Society (the only charitable society in the village). This was done through a participatory approach with the farmers to benefit of their indigenous knowledge and experiences regarding water management. Held in the reserve complex, a workshop was held with the farmers in the village to discuss the best way of irrigating the terraced gardens in Dana village. The workshop was facilitated by an agriculture engineer, who is a specialist in irrigation systems. Subsequently, more than 500m of pipes were installed linking water canals to build a good irrigation system.

The water irrigation system in the village orchard gardens have been developed and enhanced, and many canals had been repaired and maintained. The use of the farmers local knowledge was very important to find the best arrangement and routes that canals should follow to have the most

efficient canal arrangement. 60 m of canals were constructed and maintained in the orchard gardens of Dana village. The main beneficiaries were the farmers who own the gardens, which have now a higher share of water for plant irrigation, thanks to the reduction of water loss by evaporation. A total of 19 farmers benefited from this canal system improvement scheme.

Because of the topography of the area, most of the orchards are located in highly sloped areas, so the following activity was carried out for soil conservation:

(3) Soil monitoring and conservation

A soil erosion monitoring programme has been established as part of the activities of the first phase of the SUMAMAD project in the southern areas of Rumanah Mountain. Located at the heart of the core area of the biosphere reserve, this area was chosen because the juniper forest stands are in a die-back process. While this activity is still on-going in 2008 and beyond, it can already be said at this stage that one of the major processes which are evident throughout Dana Biosphere Reserve is that erosion here causes the detachment and movement of topsoils by the actions of wind (deflation) and flowing water. Erosion can be considered as the main factor affecting the decline of vegetation cover in some parts of the reserve, particularly in the Mediterranean and semi-arid areas.

Income generating activities to diversify the economic base at household levels

Dana BR has many income generating activities, such as jewelry production at the silver workshop, fruit drying workshop, and a leather tanning project. A new income generating activity has been developed through the SUMAMAD project, which uses olive oil to produce olive soaps. An olive oil soap workshop was created thanks to funding provided under the SUMAMAD project.

In Dana village and other villages and towns around the biosphere reserve, people have a lot of olive farms which produce the best olive oil in southern Jordan. All olive trees are grown without the use of pesticides and fertilizers. Despite the every good quality of olive oil, the producers suffer marketing and price fluctuation problems. Part of the olive oil produced by local farmers are now used to produce high quality olive oil soap within the Dana Reserve Centre complex. The soap is free of chemicals and is produced using traditional methods. The soap pieces have inscriptions inspired from animals and plants of Dana BR. The product is being used in all eco-tourism sites of the biosphere reserve to promote the soap.

Since the second year of the SUMAMAD project implementation in Dana BR, good olive oil soap has been developed through the activities of the SUMAMAD project (see Picture 1), but because of the increasing development of other olive oil soap products in the national market in Jordan, a new theme and concept have been developed and added to our primary soap product.



Picture 1

After exploring the market for similar products, we had to ask whether our prototype had a good competitive advantage among other olive oil soap products. After the consultation of marketing experts and a local expert in soap production, a conclusion has been reached to further study the development potential for the product, regarding two issues:

- 1- The way the olive oil soap is presented and sold.
- 2- The content of natural ingredients that are used in producing the soap.

Working with a professional local expert who is knowledgeable on producing olive oil soap in the traditional way, it was decided that new olive oil soap shapes and characteristics are needed to increase marketing opportunities: A new presentation way has been developed so that visitors can cut their soap directly from the main piece in different dimensions and shapes. Moreover, new herbs and plants have been introduced. For example, a new prototype of olive oil soap has been developed with lemon, as acidic soap has very good properties for skin care (see Picture 2).



Picture 2

The local response for this project were very positive, since the project team was able to recruit two young women for olive oil processing. In addition, a large amount of olive oil is bought from the local farmers for the production of the soap. This new and alternative income generating activity added to the past positive response of the previous initiatives carried out by Dana BR, resulting in an increased and overall appreciation by local people towards the need to conserve natural resources while at the same time benefitting from the processing and marketing of natural and organic products.

One of the main socio-economic surveys that have been carried in the site under the SUMAMAD project, was a socio-economic study on all communities who live in the western part of Dana BR (Feynan, Graigrah, Al Rashaydeh and Al-Guaibeh).

Various national seminars were conducted at Dana BR to outreach to local communities on SUMAMAD project activities. A seminar on water conservation and irrigation techniques of the terraced gardens was held in September 2005 for farmers from the district. Moreover, a national seminar on dryland conservation issues was held in December 2006, which was opened by the Governor of Boseira District and by the Director-General of the Royal Society for the Conservation of Nature. With over 30 participants, the seminar was targeted at stakeholders from the local government, local communities, local specialists in agriculture and dry lands and others, and comprised lectures on various subjects including rangeland uses and assessments in drylands.

Specific objectives, expected outputs and activities of the project

The ultimate objective for the second phase of the SUMAMAD project is to develop a community-based grazing management scheme with the full participation of the local community. Through a participatory approach, it is expected that effective and agreed-upon grazing regulation schemes can be implemented at Dana BR.

The specific objectives are to:

1. Prepare and implement a comprehensive baseline survey on livestock and rangeland use and to identify current grazing activities.
2. Review relevant literature on effective participatory approaches and outreach mechanisms to local communities.
3. Characterize pastoral communities using the natural resources of Al Bara area in Dana BR.
4. Develop scenarios for grazing management in full consultation with the local community.
5. Regulate and manage grazing in Dana BR through the preparation of an integrated rangeland and livestock management plan.

Detailed work plan for 1st Year and for 5 years and proposed budget:

| Objectives | Year 1 | | | | Year 2 | | | | Year 3 | | | | Year 4 | | | | Year 5 | | | | 2009 Budget (in US\$) | |
|---|---|-----|-----|-----|--------|-----|-----|-----|--------|-----|-----|-----|--------|-----|-----|-----|--------|-----|-----|---------------------|--------------------------|-------|
| | Q 1 | Q 2 | Q 3 | Q 4 | Q 1 | Q 2 | Q 3 | Q 4 | Q 1 | Q 2 | Q 3 | Q 4 | Q 1 | Q 2 | Q 3 | Q 4 | Q 1 | Q 2 | Q 3 | Q 4 | | |
| Objective 1: | Prepare and implement a comprehensive baseline survey on livestock and rangeland use | | | | | | | | | | | | | | | | | | | From SUMA MAD | From RSCN | |
| Collect information about Al Bara carrying capacity. | | | | | | | | | | | | | | | | | | | | | 10,000 | 2,000 |
| Determine stocking rate (annual grazing capacity). | | | | | | | | | | | | | | | | | | | | | 2,000 | 500 |
| Determine shares per household. | | | | | | | | | | | | | | | | | | | | | 2,000 | 500 |
| Delineate grazing sites within the Al Bara area. | | | | | | | | | | | | | | | | | | | | | | |
| Develop watering points for grazing animals within the Al Bara area. | | | | | | | | | | | | | | | | | | | | | | |
| Determine current grazing activities and movements inside the reserve and its surrounding areas | | | | | | | | | | | | | | | | | | | | | 2,000 | 1,000 |
| Identify problems associated with the current grazing activities | | | | | | | | | | | 8 | | | | | | | | | | 1,000 | 800 |

| Objectives | Year 1 | | | | Year 2 | | | | Year 3 | | | | Year 4 | | | | Year 5 | | | | 2009 Budget (in US\$) | |
|---|---|----|----|----|--------|----|----|----|--------|----|----|----|--------|----|----|----|--------|----|------------------|-----------|--------------------------|--|
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | | |
| Objective 2: | To review relevant literature on participatory approach and outreach mechanisms to local communities | | | | | | | | | | | | | | | | | | From SUMA MAD | From RSCN | | |
| Review current and previous studies in participatory approaches in Jordan | | | | | | | | | | | | | | | | | | | | | | |
| Document and disseminate lesson learned on these approaches | | | | | | | | | | | | | | | | | | | | | | |
| Determine and select the most appropriate approach to be used in | | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----------------|-----|
| Barra area | | | | | | | | | | | | | | | | | | | | | | |
| Hold a technical workshop for exchange experience and information | | | | | | | | | | | | | | | | | | | | | 2,000 per year | 500 |

| Objectives | Year 1 | | | | Year 2 | | | | Year 3 | | | | Year 4 | | | | Year 5 | | | | Budget |
|--|---|----|----|----|--------|----|----|----|--------|----|----|----|--------|----|----|----|--------|----|----|----|--------|
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | |
| Objective 4: | To develop scenarios for grazing management in full consultation with the local community. | | | | | | | | | | | | | | | | | | | | |
| Present all surveys and research findings to targeted local communities and main stakeholders | | | | | | | | | | | | | | | | | | | | | |
| Conduct workshops to discuss best practices and scenarios for grazing management in the project area | | | | | | | | | | | | | | | | | | | | | |
| Develop comprehensive scenarios based on community approval | | | | | | | | | | | | | | | | | | | | | |

| Objectives | Year 1 | | | | Year 2 | | | | Year 3 | | | | Year 4 | | | | Year 5 | | | | Budget |
|---|---|----|----|----|--------|----|----|----|--------|----|----|----|--------|----|----|----|--------|----|----|----|--------|
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | |
| Objective 5: | To regulate and manage grazing in Dana BR through preparation of an integrated rangeland and livestock management plan | | | | | | | | | | | | | | | | | | | | |
| Analyze major survey findings and recommendations | | | | | | | | | | | | | | | | | | | | | |
| Develop an integrated rangeland and livestock management plan | | | | | | | | | | | | | | | | | | | | | |
| Develop a comprehensive implementation mechanisms including MOU with the targeted local communities | | | | | | | | | | | | | | | | | | | | | |
| Develop a M & E system to evaluate progress and impact | | | | | | | | | | | | | | | | | | | | | |

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|-------------------------------------|---|-----------------------------|
| Income generating activities | 1. RSCN will contribute financially from the ongoing income | Budget will covered by RSCN |
|-------------------------------------|---|-----------------------------|

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|--|---|--|
| | generating activities. 2. RSCN will build the capacity and facilitate the community driven income generating activities. | |
|--|---|--|

The total budget for 2009 SUMAMAD project activities: 22,000 US Dollars.

Counterpart contribution per year (in US Dollars):

| | 2009 | 2010 | 2011 | 2012 | 2013 | Total |
|---------------------------------|-------------|-------------|-------------|-------------|-------------|--------------|
| SUMAMAD Member State | 6,800 | 6,800 | 6,800 | 6,800 | 6,800 | 34,000 |

Composition of the team

The Royal Society for the Conservation of Nature (RSCN). The following list provides the names and functions of the SUMAMAD team in Dana BR:

- 1) Ma'en Al-Smadi, Project coordinator/head of reserves at RSCN.
- 2) Mohammed Yousef, director of conservation at RSCN.
- 3) Amer Al-Rofa'a, Dana BR Manager, RSCN.
- 4) Ibraheem Al Khsaba, Dana BR ecologist, RSCN.
- 5) Hatem Taifore, plants researcher/research section, RSCN.
- 6) Ghazi Al-Rofa'a, Dana BR community liaison officer, RSCN.
- 7) Hawrrwn Al-Khawaldeh, Dana BR, head of socio-economic projects.

Priorities of training needs

1. Water recourses management (water shade, rivers, basin...).
2. Rangeland management.
3. Community participation approaches.