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NATIONAL RANGELANDS DEVELOPMENT PROJECT
IN
THE HASHEMITE KINGDOM OF JORDAN

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ABSTRACT

The project was identified by a joint ESCWA/FAO mission that visited Jordan during June-July 1986. The mission realized that, given the present technical, institutional and financial conditions, the strengthening of the existing institution in charge of rangeland development at the national level is of high priority, providing the sound basis for the implementation of future activities regarding desertification control.

The proposed project is a 3-year project. Its long-term objectives comprise raising self-sufficiency ratio in red meat, improving rural life, combating desertification and increasing the efficiency and effectiveness of the Department of Forestry and Soil Conservation. On the other hand, immediate objectives include improving range management techniques, introducing better grazing models, improving extension in rangeland utilization and preparing national range management plan as well as investment projects for rehabilitating and developing rangelands.

The project will realize its activities through providing fellowships to professionals in the field of range management, conducting training programmes for technicians and junior staff, preparing seeding programmes, establishing and operating trial, demonstration, and data collection sites and improving range husbandry techniques.

The Government will provide the logistic support for initiating the project and provide the professional staff and technicians to be trained. Government inputs amount to JD 188,000 equivalent to US \$ 550,000. External contribution include internationally recruited experts, equipments and training, costing US \$ 1,177,000.

NATIONAL RANGELANDS DEVELOPMENT PROJECT
IN
THE HASHEMITE KINGDOM OF JORDAN

1. INTRODUCTION

The present project was identified by a joint ESCWA/FAO mission that visited Jordan during June-July 1986. The objective of the mission was to define and prepare a rehabilitation project in rangelands to combat desertification. The mission held intensive discussions with a number of officials from related Governmental Departments and from cooperatives and other non-governmental organizations, UN and bi-lateral agencies active in the field of combating desertification. It undertook a number of field investigations in eastern and southern regions of the Kingdom and acquainted itself with ongoing activities in the above mentioned field. Finally it reviewed several project proposals formulated by various international, regional and bi-lateral agencies as well as the Five Year Development Plan 1986-1990.

Taking into consideration the present technical, institutional and financial conditions; the mission came to the conclusion that strengthening the existing institution in charge of rangelands development at the national and district levels, i.e., the Department of Forestry and Soil Conservation, is of much higher priority than implementing a desertification control project in a given rangeland area. The mission believes that strengthening this Department would increase its capacity to design and carry out various activities in the field of desertification control. Aspects requiring strengthening include:

- (i) Staffing: the Range Division within the Department of Forestry and Soil Conservation (DFSC) is under-staffed and lacks trained professionals and technicians in the field of range management, specially if comprehensive range rehabilitation programmes are to be launched.
- (ii) Technical information: several local and exotic range species could be used to enrich the rangelands.
- (iii) Sylvo-pastoral management system: the need is pressing for specific demonstration models for the development and optimum use of range resources with the participation of livestock herders.
- (iv) Investment: very limited investments were, so far, directed to the development of rangelands in spite of the high potentials of these resources for the development of the Jordanian rural economy.

2. JUSTIFICATION

The Hashemite Kingdom of Jordan is located in the western part of Asia between latitudes 39° 30' and 33° 30' north and longitudes 35° and 39° east. It covers an area of approximately 96,500 km². Topographically, Jordan may be classified into three regions:

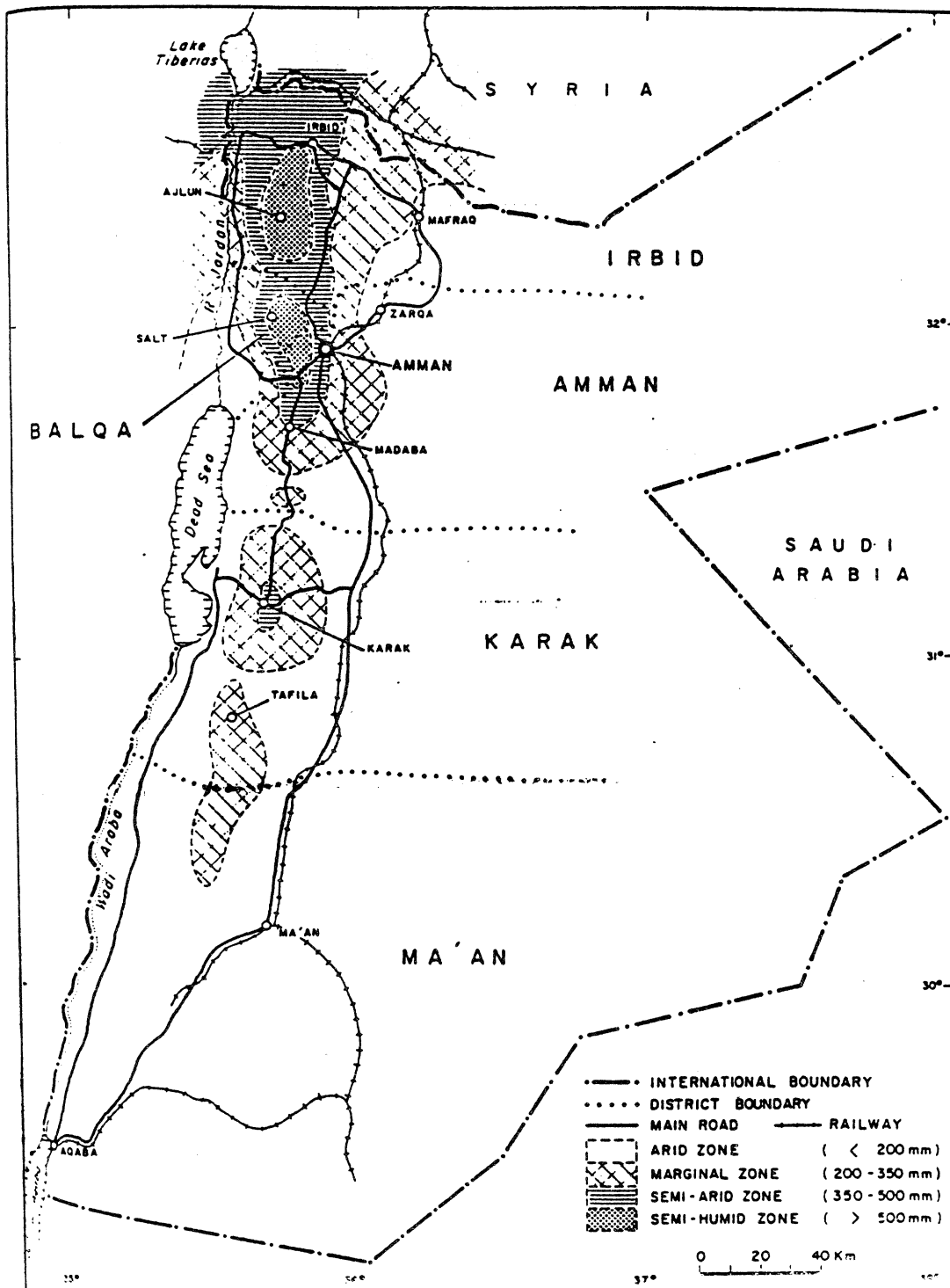
- (i) The low-land areas comprising Jordan Valley, the Dead sea and Wadi Arab Depression;
- (ii) The high-lands comprising the two banks of River Jordan and Dead Sea Depression and;
- (iii) The eastern upland plateau extending from the west to the borders with Saudi Arabia.

On the other hand, Jordan may be classified into four agro-climatic zones (see map 1);

- (i) The arid (badia) zone receiving less than 200 mm of rainfall, covering about 8,456,900 ha and extending from the Syrian borders in the north to the Saudi Arabian borders in the south and from east of Al-Hijaz railway in the west to the eastern borders of the country.
- (ii) The marginal zone with 200-350 mm of rainfall and covering about 536,000 ha. This zone comprises:
 - (a) the area extending from the Syrian border parallel to the arid zone in the east and the semi-arid zone in the west and south of Madaba;
 - (b) the area extending from the southern ghors and around Karak town and;
 - (c) the area extending between Wadi Mousa in the west and the southern desert in the east, and from Al Tafeela in the north to Ras Al-Naqab station in the south.
- (iii) The semi-arid zone with 350-500 mm of rainfall, covering about 135,900 ha and comprising the elevated areas scattered in the marginal zone;
- (iv) The semi-humid zone, receiving more than 500 mm of rainfall and covering about 98,900 ha, scattered in the northern high-lands.

The rangelands of Jordan, approximately 7,680,000 ha, cover 83 per cent of the total East Bank land area. The rainfall in this area is below 200 mm and, in fact below 100 mm over more than 90 per cent of the rangelands. According to the 1986 FAO Production yearbook, there are 15,000 camels, 40,000 cattle, 1,000 000 sheep and 500,000 goats in the country as a whole. It has been suggested that as much as 70 per cent of the grazing livestock feed comes from the range-lands, yet still this herd size is very much out of proportion with the rangeland resources. According to an ECWA study carried out in 1977, a reasonable livestock policy would limit the national flock at 600,000 sheep units in order to prevent over grazing.

AGROCLIMATOLOGICAL ZONES OF JORDAN



The rangelands are deteriorating, not only due to the increasing rate of overgrazing, but also due to excessive fire wood collection, unwise cultivation and indiscriminate use. There is a danger that increasing stock numbers, combined with periodic droughts and uncontrolled grazing practices will result in catastrophic losses unless immediate action is taken by the Government.

In an ongoing study carried out by ESCWA on the formulation of a plan of action to combat desertification in Jordan, the extreme shortage in qualified and trained personnel in the field of range management was cited as one of the major obstacles to range development. There is only one qualified officer in the field of range management, heading the range Section in the Forestry and Soil Conservation Department. All activities of range management both in DFSC or in the Jordanian Cooperative Organization (JCO) are run either by foresters or by staff trained in different fields of agriculture, other than range.

Therefore, the reasons for proposing this national project may be summarized as follows:

- (i) the urgent need to prevent further desertification;
- (ii) the government's awareness and desire to implement a policy for the rangelands;
- (iii) the potential for rehabilitation has been amply illustrated by the meagre efforts already carried out within the Ministry of Agriculture; and
- (iv) the need to increase animal production.

3. THE DEPARTMENT OF FORESTRY AND SOIL CONSERVATION

The Department of Forestry and Soil Conservation (DFSC) is one of the six technical departments of the Ministry of Agriculture. DFSC, which is entrusted with range management, carries its field functions through the five Agricultural District Offices in Amman, Salt, Irbid, Karak and Maan.

3.1 Organizational Structure

DFSC is headed by a Director, who is responsible to the Minister through the Under-Secretary and is assisted by an Assistant Director. The Department is organized into four sections: Forest Management Section, Afforestation Section, Rangeland Section and Soil Survey Section.

3.2 Main Functions

The main functions of DFSC may be summarized as follows:

- (i) conserving, improving and developing public and private forests;
- (ii) afforestation of public and private bare lands for the purpose of soil conservation;
- (iii) establishing and developing forest nurseries to produce seedlings;
- (iv) conserving wild life in the forest areas;
- (v) conducting experimental studies on forest trees;
- (vi) improving and expanding grazing land;
- (vii) determining grazing land locations; and
- (viii) allocating the number of livestock on each grazing location according to its productivity.

3.3 Constraints

The Department of Forestry and Soil Conservation is facing many obstacles and constraints in carrying out its functions, specially with respect to rangelands. The main constraints may be summarized as follow⁽¹⁾:

- (i) understaffing and lack of properly qualified and trained personnel;
- (ii) insufficient knowledge and data about different aspects of range life in various range areas;
- (iii) inadequacy of experimentation in rangelands;
- (iv) lack of demonstration models for silvo-pastoral management;
- (v) lack of a well defined range development plan;
- (vi) insufficient extension service in rangelands; and
- (vii) lack of seed management programme for rangelands replanting.

(1) With respect to the Rangeland Section.

4. THE PROJECT

4.1 Long-term Objectives:

The long-term objectives of the project are to:

- (i) improve the degree of self sufficiency in livestock feed and livestock products;
- (ii) raise the income and standard of living of farmers and stock keepers in the marginal rainfed agricultural subsector through improved management of rangelands and forests on a sustained yield basis;
- (iii) increase the efficiency and effectiveness of the Department of Forestry and Soil Conservation and pave the way for the establishment of a Department for Range Development; and
- (iv) combat desertification through the rehabilitation and the rational use of rangelands.

4.2 Short-term Objectives

The immediate objectives of the project are to:

- (i) strengthen the technical capacity of the Department of Forestry and Soil Conservation in programming and implementing activities and projects in the field of rangeland developments;
- (ii) identify and set-up improved techniques of range rehabilitation;
- (iii) collect and process socio-economic data and define reference grazing models;
- (iv) improve extension services; and
- (v) prepare a set of investment projects related to rehabilitation and development of rangelands.

4.3 Project Activities:

The project will carry out the following set of activities:

4.3.1 Strengthening the Technical Capacity of the Department of Forestry and Soil Conservation: This will be realized through:

- (i) the provision of 3 fellowships suitably phased for three nationals to obtain training in range management;
- (ii) establishing an intensive training course for forest technicians and sylvo-pastoral management, to be followed by study tour for ten technicians of the Forestry and Soil Conservation Department;

- (iii) establish a course in range training for junior staff such as range guards and range assistants; and
- (iv) prepare and publish a manual on sylvo-pastoral and range management.

4.3.2 Improved techniques of range rehabilitation:

- (i) collection and evaluation of fodder plants and shrubs for different ecological areas;
- (ii) improvement of plant husbandry and water harvesting techniques; and
- (iii) establishment of a seed management programme.

4.3.3 Reference models for range management:

- (i) establish a limited number of sites where an improved integrated grazing management programme can be implemented;
- (ii) establish two mobile non-formal education teams for contacting villagers and farmers to activate a dialogue and enable a better understanding of the range development policies; and
- (iii) establish a network of approximately 100 range monitoring sites to provide data for the proper management of grazing lands.

4.3.4 Investment projects:

- (i) prepare a national rangeland development plan on zoning basis in co-operation with other relevant institutions and land use interests; and
- (ii) prepare investment projects for priority zones.

4.4 Outline of the Training Course for Forest Technicians:

- (i) the grazing economy in Jordan;
- (ii) Jordan vegetation types:
 - important plant communities, range conditions and trends
 - identification of trees, shrubs, bushes of economic values.
- (iii) Pastoral systems and custom:
 - intensive systems
 - extensive systems
 - semi-nomadic or transhumance
 - nomadism

(iv) Socio-economic characteristics:

- population on rangelands
- crops and trees on rangelands
- livestock
- soils
- organization.

(v) Forest and rangeland grazing management:

- grazing management
- management of animal number
- animal distribution
- grazing by different animal species
- nutritional and seasonal grazing
- forest grazing systems.

(vi) Forest and rangeland rehabilitation and improvement:

- forest trees and shrubs
- seeding of ranges and pastures
- planting trees and shrubs
- nutritional values of forage
- fertilization
- water and soil conservation

(vii) Planning and preparation of silvo-pastoral management project:

- inventory of socio-economic resources
- inventory of physical and biological resources
- evaluation of data and production techniques
- preparation of the project.

(viii) Economic and financial evaluation of rangelands project:

- economic and financial analysis
- direct and indirect costs and benefits
- estimation of project expected costs and benefits
- measures of economic and financial viabilities:
 - . benefit-cost ratio
 - . internal rate of return
 - . pay-back period.
- projected income statement
- projected statement of funds flow
- projected balance sheet

(ix) Practical field experience:

- determination of range condition
- determination of grazing capacity
- taking of annual census in a selected area
- calculation of a feed budget
- water spreading techniques.

4.5 Location of Project

The project will be located in the Department of Forestry and Soil Conservation, from where it will direct its activities. The training courses will be conducted in the premises of the College of Agriculture. Five of the stations of the Department of Forestry and Soil Conservation will be selected where improved grazing management programmes will be implemented. The stations preliminary selected for this activity are Maan, Uneiza, Jofred Darawish, Hasa and Qatrana. One hundred range monitoring sites will be selected to represent different range areas from where data will be collected to formulate a rangelands data bank.

5. STRATEGY

5.1 Planning the Project Activities

To ensure successful implementation of the project, appropriate planning is necessary in order not to disturb the ongoing activities of the Department of Forests and Soil Conservation, in which the project will be located. For this purpose the project functions could be classified into four sets:

- (i) Functions that could be incorporated within those already undertaken by DFSC. These will be planned for in co-operation with the management of DFSC. Local counterparts would need to be designated to get on-the-job training. Examples of these functions include; activity (iv) under item 4.3.1, activities (i), (ii) and (iii) under 4.3.2. and activities (i) and (ii) of item 4.3.4 above.
- (ii) Functions requiring additional staff members. These will be planned for with MOA and DFSC. Local counterparts would need to be designated to get on-the-job training. Examples of these functions include activities (i), (ii) and (iii) of item 4.3.3. above.
- (iii) Training of three experts outside the country which will be phased to suit the proper functioning of DFSC.
- (iv) Training of technicians and field personnel, which will be undertaken by the Project personnel and consultants. Timing of and participation in these training programmes will be selected to ensure the proper functioning of DFSC.

5.2 Selection of Monitoring Sites

In selecting sites the establishment of improved integrated grazing management programmes, anthropological/social factors as well as agricultural and other technical factors will be considered. The network of 100 range monitoring sites will be selected to cover different areas of rangelands.

6. INSTITUTIONAL FRAMEWORK

The project will be attached to the Department of Forestry and Soil Conservation of the Ministry of Agriculture. The Ministry will be responsible for providing counterpart staff and the other items earmarked for local funding as given in section 7.1 (government inputs).

The Government will provide the logistic support for initiating the project. It will also take necessary steps to provide the professional staff and technicians to be trained during the project period.

The modalities of the project execution will be determined at a later stage in consultation with all concerned parties. The specific roles of each party will also be determined at that time.

7. INPUTS

7.1 Government Inputs

7.1.1 Personnel

The proposed government contribution for providing counterparts and personnel is as follows:

<u>Position</u>	<u>No</u>	<u>M/m</u>	<u>JD</u>
Project manager (counterpart)	1	36	14,800
Professionals (range management)	3	108	21,600
Technical assistants	10	360	43,200
Field staff	10	360	43,200
Secretary	1	36	4,320
Accountant	1	36	5,400
Drivers	5	180	<u>16,200</u>
Subtotal for personnel			148,720

7.1.2 Miscellaneous

The Government will provide the operating costs of the vehicles amounting to JD 35,000 and equipment and supplies amounting to JD 4,260.

The total value of counterpart contributions to the project is estimated at JD 187,980, equivalent to approximately US\$ 550,000.

7.2 External Contribution

The estimated donor contribution for the project, amounting to US\$ 1,177,000, is designed to cover the costs of the project manager and expatriate experts, equipment, facilities, operating expenses, travel and training.

7.2.1 Personnel

- Project manager-cum-sylvo-pastoral management expert; responsible for the initiation, operation and overall co-ordination of the project activities. The incumbent should have extensive experience in range management and extension work in similar climatic conditions. Management experience in multi-disciplinary projects is desirable.

- Consultants; in the fields of agricultural extension, water harvesting, seed multiplication, land use, rural sociology, forest and range economics and project evaluation; to help in carrying out project activities, especially training programmes.

Over the total project period of three years, the appointment of international staff is planned as follows:

<u>Position</u>	<u>Man months</u>	<u>US \$</u>
Project manager	36	288,000
Consultants:		
Extension expert	8	64,000
Water harvesting	4	32,000
Seed multiplication	10	80,000
Land use	4	32,000
Rural sociology	4	32,000
Range economist	4	32,000
Project evaluation expert	<u>8</u>	<u>64,000</u>
Subtotal expatriate experts	78	624,000

7.2.2 Equipments and Facilities

The external contribution will provide the following equipments and facilities:

<u>Item</u>	<u>US \$</u>
4x4 cross country vehicles (3)	45,000
Town vehicles (2)	15,000
Mobile cinemas	40,000
Survey and monitoring	15,000
Seeds	7,000
Cartographic equipment	10,000
Audio visual equipment	20,000
Water reticulation	15,000
Farm machinery (tractors, trailers, etc.)	80,000
Miscellaneous	<u>6,000</u>
Subtotal equipment and facilities	253,000

7.2.3. Training

Training of counterparts will include providing for fellowships, study tours and local training:

<u>Item</u>	<u>M/m</u>	<u>US \$</u>
Fellowships	108	160,000
Study tours		40,000
Local training		<u>100,000</u>
Subtotal training		300,000

8. **ACTIVITIES**

Main project activities, their starting dates and duration are as follows:

<u>Activities</u>	<u>Starting</u>	<u>Duration (month)</u>
Formulation of work programme	July 87	1
Selection and preparation of site	July 87	1
Calling for, collection and evaluation of tenders	July 87	2
Selection of counterparts	July 87	3
Ordering of equipment and supplies	Sept 87	2
Collection and evaluation of fooder trees and shrubs	Nov. 87	25
Preparing sites for grazing management trials	Nov. 87	5

Trying improved grazing management programmes	March 88	28
Improving range husbandry techniques	January 88	30
Preparing and implementing a seed management programme	Nov. 87	32
Establishing monitoring sites in rangelands	Oct. 87	10
Operating monitoring sites in rangelands	Nov. 87	32
Train mobile extension teams	Nov. 87	6
Set mobile extension team (1) to action	January 88	30
Set mobile extension team (2) to action	March 88	28
Establish training course for present Technicians and range management	March 88	6
	March 89	6
Establish training course for junior Staff in range management	March 88	6
	March 89	6
Preparing and implementing range management programmes	July 88	24
Preparing and implementing national range management plan	July 88	24
Preparing investment projects in rangelands	April 89	15
Prepare and publish a manual on sylvo-pastoral range management	July 89	12
Send 3 Professionals on fellowships	Sept. 87	30
	Sept. 88	30
	Sept. 89	30

The following comments need to be mentioned with respect to the activities and functions carried out by the project:

(i) Four types of range utilization are presently experienced in Jordan: (a) Government; (b) Jordan Co-operative Organization; (c) Animal production companies and (d) private holdings. These four models of range utilization will be evaluated according to:

- Impact on environment and range regeneration;
- Increase in domestic and meat production and;
- Rural development.

The results of the evaluation will be compared with other models of range utilization applied in other countries of the region to enable the selection of optimal range management practices in Jordan.

- (ii) The seed management programme to be prepared and implemented by the project will take into consideration possibilities of introducing new species of range plants through carrying out experimental work.
- (iii) The monitoring sites will be selected to represent various range areas in Jordan.
- (iv) In preparing the national range management plan (i), (ii) will be taken into consideration along with all data and information collected by the project from the monitoring sites as well as experimental sites.

9. OUTPUT

9.1 Direct Output

Expected direct outputs of the project are estimated as follows:

- (i) Three professionals properly trained and qualified in the field of range management.
- (ii) Ten technicians and ten junior staff members properly trained in the field of sylvo-pastoral management.
- (iii) Publishing a manual on sylvo-pastoral and range management.
- (iv) Introducing new and more productive species of range plants.
- (v) Publishing a paper on natural range plants and shrubs on rangelands in Jordan.
- (vi) Improved range husbandry techniques.
- (vii) Implementing a seed management programme.
- (viii) Formulating two mobile extension teams in the field of range management.
- (ix) Establishing 100 range monitoring sites in different areas of rangelands.
- (x) Preparing a national range management plan.
- (xi) Preparing investment projects for range development in priority zones.
- (xii) Increasing the efficiency and effectiveness of the Department of Forest and Soil Conservation.

9.2 Indirect Output

The project's indirect outputs include:

- (i) Increasing red meat production.
- (ii) Increasing the income of farmers and stock holders.
- (iii) Arrest desertification and rehabilitate already affected areas.
- (iv) Improve rural life.

10. WORK PLAN

The proposed activities described in chapter 7 above will be undertaken according to the following plan:

11. FOLLOW-UP

After completion of the project activities within the Department of Forest and Soil Conservation, follow-up service is planned. The details of the of the plan will be worked out in the final report. Yet, it is suggested that a permanent relation between the Department and the relevant divisions in the executing agencies, proposd to be FAO and ESCWA should be established.

BIBLIOGRAPHY

1. Arab Organization for Agricultural Development (1979), Technical and Economic Feasibility Study for Developing Range in Southern Parts of Jordan
2. Baily, E.T., (1978): Pasture and Fooder Plant Introduction and Establishment Problems for Jordan (FAO Report No. 2405).
3. Ben Ali, M., (1985) Pasture Establishment and Propagation in Jordan and Tunisia (FAO Report).
4. ESCWA (1985-a) : Agrarian Systems and the Alleviation of Rural Poverty in Jordan.
5. ESCWA (1985-b) : Red Meat, Poultry Meat and Eggs - Situation and Outlook in ESCWA Region.
6. ESCWA (1985-c) : The Human Settlement Situation in the Hashemite Kingdom of Jordan.
7. ESCWA (1985-e) : Report on Agricultural Project Identification.
8. FAO, Near East Regional Office (1976) : Desert Creep and Range Management in the Near East (Mission Report).
9. FAO, Office for Special Relief Operation (1986) : Assessment of Assistance Requirements for Drought Affected Agriculture and Livestock Sectors.
10. Government of Jordan (1977) : Jordans Experiences in Combating Desertification - Country Paper for the Regional Preparatory Meeting for the Mediterranean Area.
11. Hunting Technical Services (1956) : Report on the Range Classification Survey of the Hashemite Kingdom of Jordan.
12. Jeneidi, M.J., (1977) : The Natural Plants of Jordan and their Ecological Distribution.
13. Jeneidi, M., and Huss O.L., (1978) : Rangelands Resources of the Gulf and Arabian Peninsula Countries and their Marginal Problems and Needs (FAO Regional office for the Near East).
14. Jordan Co-operative Organization (1985) : Statistical Yearbook.
15. Kasapligil, B. (1956) : Ecological Survey of the Vegetation in Relation to Forestry and Grazing (FAO Report No. 549).
16. Long, G.A., (1975) : The Bioclimatology and Vegetation of Eastern Jordan (FAO Report No. 1109).

17. Masri, A., (1981) : Development of Range in Jordan and Range Policies.
18. Ministry of Agriculture (1973) : Agricultural Law No. 20.
19. Ministry of Agriculture (1984,1985) : Annual Reports of the Department of Forestry and Soil Conservation.
20. Ministry of Agriculture (1984,1985) : Annual Report of the Department of Research and Agricultural Extension.
21. National Planning Council (1981) : The Five Year Development Plan 1981-1985.
22. Park, B.C., (1955) : Technical Report on Range Improvement, Development and Management for the Hashemite Kingdom of Jordan.
23. Park, B.C., (1966) : A Range Management Development Programme for Jordan (FAO Report No. 9).
24. Sa'sa', A.R., (1984) : Jordan Experience in Bedouins Rehabilitation.
25. Tuttle, V.F., (1971) : Range Management Programme for Jordan (FAO Report No. 35).
26. UNEP (1983) : Report on Rehabilitation in the Eastern Low Rainfall Areas.
27. USAID (1986) : Report on Desert Rangelands Pre-feasibility Study.
28. Zarga Project Feasibility Study (1986) : Annex 9 - Range Development.
29. FAO, Draft Report of the Jordan Irbid Rainfed Project (1977), FAO Investment Centre.
30. FAO, Improving Delivery Systems of Agricultural Services to small farmers in Jordan, Technical Report (1982).

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