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THE HASHEMITE KINGDOM OF JORDAN
AGRICULTURAL RESOURCE MANAGEMENT PROJECT
SOCIO-ECONOMIC BASELINE SURVEY: KARAK AREA WADIS

The present document is the final version of the socio-economic baseline left with the IFAD team and replaces all working printouts. It takes into account comments following a presentation in Amman, July 5th, 1995. It has not yet been submitted to IFAD, Rome and may be further revised. Not to be cited under any circumstances.

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Report to IFAD

Hashemite Kingdom of Jordan

Amman, July, 1995

Executive Summary

1. As part of the preparation for the Jordan Agricultural Resource Management Project (JARMP) IFAD commissioned a socio-economic baseline survey of the Karak area to examine basic subsistence parameters of households, including;

a) Family status and available resources
b) Access to physical and social infrastructure
c) Labour profile of the household
d) Input and output costs and expenditures for farm enterprises leading to a measure of the extent of poverty
e) Technology present and future
f) Understand farmers' perception regarding resource degradation
g) Present situation of women
h) Means for promoting intensive livestock breeding, and integration of crop production and livestock
i) Participation in decision making

2. The survey was conducted in June 1995. The data was entered, checked and analysed in Amman. The sample size of questionnaires was as follows;

Questionnaire	Number	Dates
Household Record	366	10-28/6/95

3. The main findings were as follows;

The poorest stratum of society in this region, expatriate day labourers, cannot be reached by a project of this type. The existence of such a cheap and flexible workforce confirms that labour is not a constraint on agricultural investment

Much of the best agricultural land in the region is worked through a variety of short-term share-cropping arrangements. This has entrained very poor land management strategies

Low-input agriculture is concentrated in zones where rainfall is uncertain and cannot be supplemented by other water sources. The choice to eschew inputs is thus a rational economic choice and not a result of an information gap

Landholdings are small, but the nature of the terrain in the wadis and renting/owning combinations restrict the potential for consolidation. Holdings are notably larger in the open land on the Plateau.

The system of official subsidies on major crops (cereals, tomatoes etc.) has had the effect of restricting the diversity of crops grown and bolstering uneconomic production methods

As a consequence, regional marketing systems are poorly developed leading to an over-emphasis on Amman. This has the effect of further discouraging trials with new crops

Ownership and access to water in some wadis is highly controversial and has acted to deter farmer investment

Farmers appear to have good access to agricultural machinery, much of it available at subsidised rates. The retention of technologies such as the donkey-plough reflects the steep terrain not farmers' conservatism

The status of soil and water conservation is highly variable from one wadi to another but is almost entirely determined not by presence or absence of technical knowledge but social conditions of land ownership

The great majority of farmers in the region are permanently indebted both to informal sector lenders (landlords, middlemen) and parastatals. Increasing the availability of rural credit still further is unlikely to affect agricultural investment

Agricultural extension is near-absent throughout much of this area

4. Principal Recommendations

- The focus of the project be targeted more precisely in areas where ownership conditions farmers are likely to invest in land improvements
- The project emphasise revitalising regional trade, through the establishment and improvement of wholesale markets and rural access roads
- The development of incentives for crop and produce diversification especially honey production and small ruminant raising
- Establishment of feasibility of small-scale flood-control works in partnership with the community
- Expansion of the agricultural extension system to settlements inhabited by farmers with particular emphasis on introducing crop rotation

IMPORTANT

This report is also presented as an electronic document with 'live' embedded charts and attached spreadsheets. The basic word-processor is Microsoft Word 6.0 (Arabic) with embedded Excel 5.0 charts and worksheets. This permits additional data to be added or changed as new material becomes available.

The original field data used in the preparation of this report is attached in the form of a database with menus, allowing readers to explore the data in a variety of ways. The native format of the database is Microsoft Access 2.0 (Arabic) but a text-delimited export version is also presented. Detailed material, such as the names of some 300 informants is given in the original Arabic.

CURRENCY EQUIVALENTS

Currency Unit	=	Jordanian Dinar (JD)
1 Jordanian Dinar	=	1000 fils
JD 1.000	=	USD 1.45
USD 1.00	=	JD 0.67

The value of the United States Dollar fell during the course of the survey (June, 1995). However, since the economic data quoted in the report are based on retrospective recall of incomes in 1994 the figures quoted above are a fair indication of the values of the USD during that year.

WEIGHTS AND MEASURES

1 *dunum*	=	0.1 hectare
1 *rotl*	=	3.0 kilogrammes

ABBREVIATIONS AND ACRONYMS

ACC	Agricultural Credit Corporation
ASAL	Agricultural Sector Adjustment Loan
DOS	Department of Statistics
GHKJ	Government of the Hashemite Kingdom of Jordan
JCO	Jordan Co-operative Organisation
JD	Jordanian Dinar
JICA	Japan Internation Co-operation Agency
PPR	Peste des Petits Ruminants
QAF	Queen Alia Fund
RSCN	Royal Society for the Conservation of Nature

TRANSCRIPTION

Arabic terms cited in the text are transcribed as accurately as possible. Phonetic symbols are avoided through the use of orthographic conventions. Spellings of place names follow those on maps published by the Royal Geographical Society where practical. Other words are spelt according to current pronunciation in Jordan.

The pharyngeal 'emphatic' consonants are marked with an underline instead of a subdot. Thus;

h̲	=	ḥ	*or*	œ
t̲	=	ṭ	*or*	
s̲	=	ṣ	*or*	ɓ

Long vowels are marked by doubling rather than with a macron over the vowel. Thus;

aa *not* ā

Original Arabic forms of interview sites, etc. are given in the annexes.

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I. PROJECT AND SECTORAL BACKGROUND

A. Background

1.1 The Government of the Hashemite Kingdom of Jordan (GHKJ) first requested IFAD to identify and formulate a project for Agricultural Resource Management in 1994. An inception mission to identify the modalities of such a project was undertaken in December/January 1994/5 and terms of reference established (IFAD, 1995).

1.2 The present survey was undertaken in June and July 1995 to form a background for the appraisal.[1/] The terms of reference (given in full in Annex I) were to survey and analyse;

Family status and available resources
Access to physical and social infrastructure
Labour profile of the household
Input and output costs and expenditures for farm enterprises leading to a measure of the extent of poverty
Technology present and future
Understand farmers' perception regarding resource degradation
Present situation of women
Means for promoting intensive livestock breeding, and integration of crop production and livestock
Participation in decision making

1.3 IFAD (1995) deals with environmental data such as rainfall, soils, forage availability and economic issues, such as feed subsidies and exports in some detail. It also covers the legal and institutional frameworks. These issues are therefore not discussed at length in the present study, but only given as necessary background to understanding the argument.

B. Country and Agricultural Sector Background

1.4 The Hashemite Kingdom of Jordan has a land area of some 90,000 km^2 and a human population of nearly 4 million. It is situated between 29°N and 33°N and between 35°E and 40°E. It is bordered by Syria in the north, Iraq in the east, Saudi Arabia in the south and east and Israel and the West Bank in the west. Of the entire land area, only 5% is estimated to be arable.

1.5 Jordan has long been heavily dependent on the service sector, both internally (tourism, transport, trade) and externally (via a highly educated expatriate population sending money back). This pattern underwent a dramatic change following the Gulf War, which resulted in the return of large numbers of expatriates and consequent boom in housing and expansion of the urban population.

1.6 Jordan also depends heavily on foreign aid and concessionary foreign assistance. One of the benefits of the 'Peace Process' has been substantial promises of debt forgiveness.

1/ The questionnaire was designed and the analyses and report were prepared by R.M. Blench, under the direction of Project Controller, M.A. Hassani, Near East and North Africa Division. See Annex I for details of other personnel involved in the survey. Mounia Hajje, whose report on WID accompanies this one, took part both in discussions on survey design and enumerator supervision. I would like to acknowledge discussions with Chantelle Hoppé and Richard Dunham. It was presented in Amman at the Ministry of Agriculture on 5th July, 1995 in the form of a working draft and I would like to thank those present for their constructive comments on the text.

1.7 The agricultural sector contributes some 7% of the GDP and has a substantial export element. However, Jordan also has a policy of subsidies on basic foodstuffs, flour sugar and rice and until recently, on animal feed, notably barley and wheat bran. Public expenditure in the agriculture sector has generally been declining.

1.8 Map 1 shows a general political map of the Hashemite Kingdom of Jordan and marks the Project Area. Since the signing the peace treaty with Israel, there have been some boundary changes not reflected on available maps. None of these, however, are relevant to the area discussed in this report.

C. Method and Context of the Survey

1.9 The principal method of the survey was intensive administration of questionnaires, combined with more informal and unstructured interviews. The questionnaires were pre-tested for two days before the survey proper and then remained fixed for the rest of the survey. Three teams were used, to complete the survey as rapidly as possible. More details of the teams and timing of the survey and the actual questionnaires can be found in the Annexes.

D. Existing Literature

1.10 The Karak region is generally very poorly described in terms of ecology and farming systems. The economy is summarised in a number of statistical reports (see references in IFAD, 1995) but these are lacking in interpretative information as well as in assessments of data quality. Descriptions of the local politics are given in Hartmann (1911) and Gubser (1973), both these texts are out-of-date and anyway focus on narrowly political issues.

1.11 The single most valuable text is Lancaster & Lancaster (1995) which gives a valuable description of farming and land access in the region between Karak and Wadi Mujib[2/]. A related paper by Johns (1992) discusses the patterns of Islamic settlement in the Karak region. The region was the focus for and Agricultural Development Project, the Karak-Tafila Development Project to be supported by Japanese aid, via JICA. A major feasibility study was presented on this region in 1990 (JICA, 1990) which contains some valuable background data. However, the project itself was never implemented.

1.12 A research project out of Reading University in England has also studied agriculture in Karak Governorate in the early 1990s. A document dated 1993 summarises the results of this survey. There are, however, no details on methods, samples or sources of information so the data remains difficult to evaluate. Preliminary reports associated with the GTZ Watershed Management Project to be based in Wadi Ibn Hammad (see, for example, Krimmell & Brechtel, 1993) also exist although these contain only limited amounts of data.

[2/] I have also benefited from unpublished reports prepared in the context of the Khirbet Faris Project and kindly made available by the Director of the BIAAH, Alison McQutitty.

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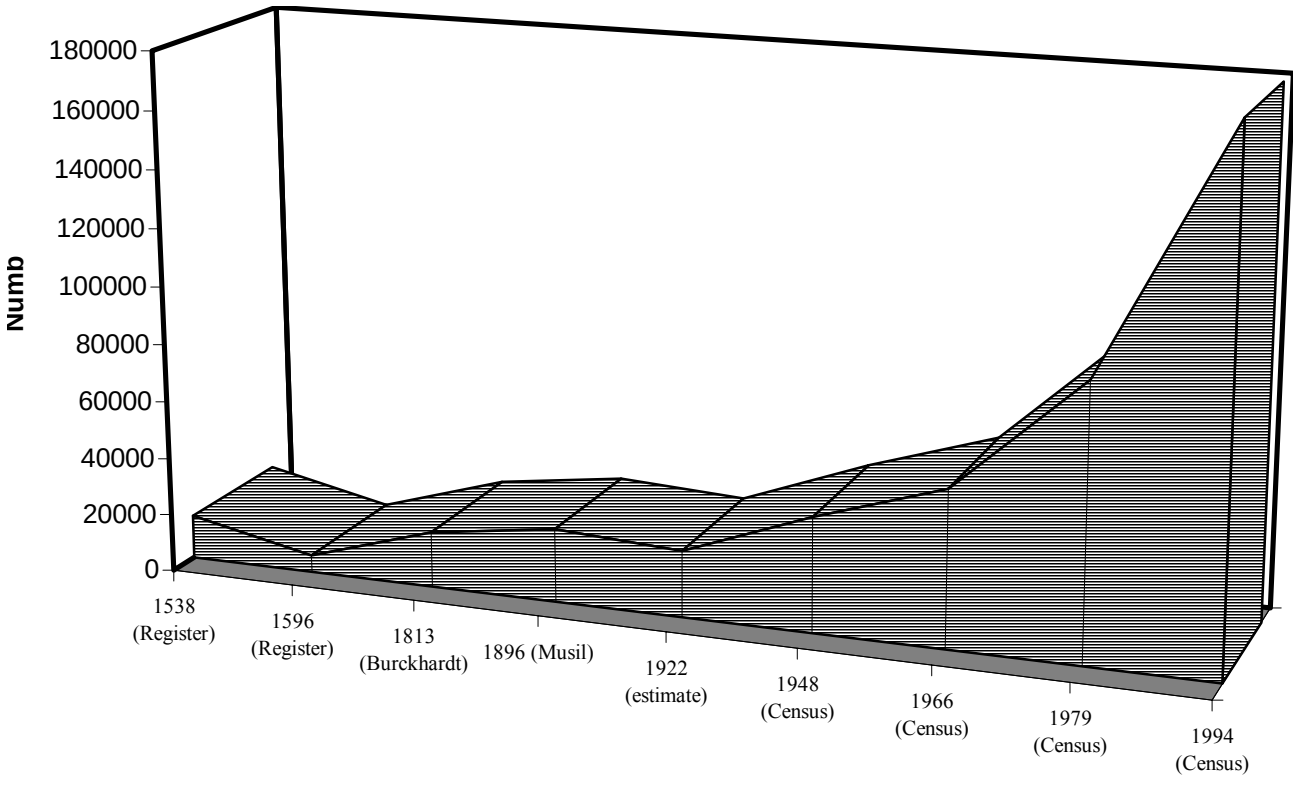
II. PROJECT AREA

A. Development and Socio-economic Status

2.1 The Karak Governorate has been estimated as one of the poorest in Jordan (IFAD, 1995 quoting a Mu'tah University Study of 1989/90). Population is at high densities and average farm size is small. One of the most distinctive features of this region is the high number of pensioner-farmers. After twenty-five years in the Civil Service, many householders retire from the urban areas with a loan deducted from their pension to build a new house. They reclaim access to family lands and build up a small agricultural enterprise, adequate to supply the household.

2.2 The human population of the Project Area remains slightly nebulous while the Project Area remains undefined. However, the population of Karak Governorate is known from the 1994 census data and can be compared with previous censuses and estimates. Figure 1 shows a historical compilation of such estimates, drawn from Lancaster & Lancaster (1995).

Figure 1. The Growth of Human population in the Karak Region



Source: Lancaster & Lancaster (1995) with additions

2.3 This indicates the marked growth of human population following both improved primary health care and the gradual evolution of off-farm employment activities.

B. Physical and Biological Resources

2.4 The original description of the bioclimates of Jordan goes back to Long (1957) and almost all subsequent descriptions follow this. Shehadeh (1985) has compiled a more up-to-date description of the climate of Jordan.

Rainfall

2.5 The rainfall and associated parameters have been described in some detail in Shehadeh (1985) and IFAD (1993). The climate of the Plateau is usually described as Mediterranean arid (cool). The peak rainfall areas are in the Highlands with over 300mm with a sharp drop to less than 50 mm in the Ghors. The rainfall is the main source of the springs and seeps found in many of the wadis. It is generally believed the water from the springs has decreased in this century. This is almost certainly due to increase human use, rather than any genuine decline in the rainfall.

2.6 Rain is concentrated in the 'winter' months (December-March) with virtually no rainfall from June-September. The Karak region shows one of the highest internannual coefficients of variation (Shehadeh, 1985: Fig. 4 estimates it at over 70%). Mean annual temperature ranges from 14°C for the highlands up to >22°C for the Ghors.

Topography

2.7 The Karak Plateau rises up sharply from the Ghors along the Dead Sea to a height of some 850m. The basic material is limestone with an overlay of basaltic soils. The Plateau is essentially a high-altitude grassland which is cut across by very deep wadis. The terrain of the walls of the wadis is deeply dissected. The bottom of the wadis is a region of marshy land which eventually flows out into regions of mud-flats and swamps along the Jordan Valley south of the Dead Sea.

2.8 The land resources in the project area can be conveniently divided into four groups:

Land class	Arabic term	Description
Plateau	*Ardh hamra*	The high-altitude grasslands occurring along the spine of central Jordan
Wadi sides	*Ardh baidha*	Dissected land on the sloping sides of the wadis
Wadi Bottom		The trough at the bottom of the wadi
Ghor	*Ghor*	The marshy land where the wadi debouches into the Jordan Valley

Flora

2.9 The main floral regions of Jordan have been classified into some thirteen types (Eisawi, 1985). The wadi catchments of the Karak region can effectively be divided into four categories. These are as follows;

1. Mediterranean non-Forest
2. Steppe
3. Tropical
4. Halophytic

2.10 The bottoms of the larger wadis, such as Wadi el-Hasa, could be deemed to fall into a fifth category, hydrophytic, although reduced water flows make this a problematic analysis.

Mediterranean non-Forest

2.11 Characterised by the principal species *Rhamnus palaestinus, Calycotome villosa, Sarcopoterium spinosum, Cistus spp.* with some *Artemisia herba-alba*. This is often seen as a type of degraded forest, existing between the areas of cultivated land.

Steppe

2.12 The main species encountered are *Ferula communis*, *Ziziphus lotus*, *Pistacia atlantica, Anabasis syriaca* with limited *Artemisia herba-alba*. Extensive cultivation in the steppe has led to a patchwork of variable plant communities.

Tropical

2.13 Natural vegetation in the tropical areas in the Jordan valley has almost been completely eliminated by intensive cultivation. Typical species are; *Ziziphus spina-christi, Calotropis procera, Balanites aegyptiaca* and *Salvadora persica.*

Halophytic

2.14 A small number of species are able to survive in the extremely saline soils adjacent to the Dead Sea. The most important are *Arthrocnemum spp., Suaeda spp., Juncus littoralis* and *Tamarix spp.*

2.15 There is reason to believe the tree flora of the wadis has been substantially reduced by agricultural land clearance and the expansion of population. Lancaster & Lancaster (ms) mention the disappearance of *butm*, terebinth, *sirr* and other trees.

2.16 In the wadi bottoms, the common shrub is oleander, *difla* along with mint, clover and occasional willow, *safsaf*. Tamarisk, *Atriplex*, *Prosopis farcta* have also been recorded.

Fauna

2.17 The natural fauna of the Karak area almost certainly once resembled that recorded in the Dana Reserve (cf. for example, Chilcott et al, 1995). A wide variety of carnivores, antelope and rodents would have lived in the wadis until quite recently. However, it is many years since large mammals have been regularly sighted.

C. Land use

Crop Farming

2.18 Most of the region is given over to dryland rainfed cereal production, with olives and almonds as perennial crops. Pulses, especially lentils and chickpeas are often introduced into the cropping cycle. Descending into the wadi, increased groundwater makes possible a wide variety of fruit trees and some vegetables. In the wadi bottoms and ghors, where the water collects vegetables are the principal crops, with some maize. In a few wadis such as Wadi Ibn Hammad, cereals such as wheat are cultivated under irrigation.

Pastoralism

2.19 These wadis are also an important region for Bedu pastoralism. Large herds of goats with some sheep and camels spend the winter in the ghors and the wadis and move up onto the Plateau at the period of harvest (June/July) to graze the stubble. The exchange of manure for stover is extremely important in the rainfed areas because of the low fertility of much of the soil.

2.20 The Bedu production systems based in the Wadi Araba contrast strongly with those described for the Eastern Badia (see Blench, 1995). Mean herd size is smaller and goats predominate although there are some substantial herds of camels. The remaining vegetation in the wadis is largely shrubs, which favours browsing animals over sheep. Natural range is much more important in the diet of the flocks compared with further east, where purchased feed predominates. These Bedu have much lower levels of services than those in the Eastern Badia, and goat products are much less saleable. For example, cheese production, the economic staple of medium-to-large herds in the eastern *hammada* deserts is virtually absent in this region. As a consequence, hired shepherds from Syria and elsewhere, usual in the Badia, are very uncommon in this region.

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III. SURVEy DATA

A. Objectives and Methodology

3.1 The broad objective of the proposed project is the development of a soil and water conservation strategy for the wadis of the Karak region from Wadi Mujib down to Wadi El-Hasa (Map 2). Within this, the intention of the socio-economic baseline survey is;

to provide the socio-economic matrix into which a feasible project can be slotted
to provide baseline data against which the overall impact of the project can be measured.

3.2 The principal method was the administration of a household questionnaire (Annex II). The household questionnaire was designed to elicit basic numerical data on household structure, farm inputs and expenditures, crop and livestock strategies and establish the willingness of farmers to participate in collective programmes.

3.3 The numerical information gathered was based on recall of 1994 so in general in could not be checked except on the rare occasions where farmers kept written records. The questionnaires included a certain degree of self-checking, so internal consistency checks often revealed inconsistencies. In some cases the questionnaire was rejected on the spot and left incomplete, in other cases it was eliminated during data entry. Overall, some 2% of the questionnaires were thrown out.

3.4 There is every reason to believe that the majority of householders answered most questions honestly. However, certain questions about income produced such inconsistent results that the data was rejected and estimates have had to be adopted. The most problematic areas were;

a) Financial contributions from household members working away.

b) Although few households claimed to receive such contributions, anecdotal evidence suggests that this practice is widespread and socially imperative throughout Jordanian society.

c) Profits from crops sold. Available information about crop yields and market prices suggests that farmers underestimated their income from this source

d) Additional income from outside employment. Some respondents simply refused to say what their income from such sources was on the grounds that it was confidential.

e) There appeared to be a particular problem with villages in the area of Tafila, many householders apparently believing that the survey was for tax purposes. Fewer questionnaires were taken, and some interviews had to be cancelled in view of the questionable reliability of the responses.

B. The Context of the Survey

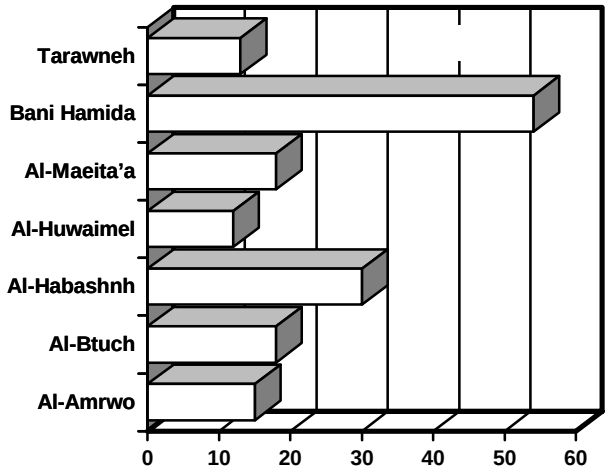
Social Structure in the Karak Region

3.5 To appreciate both the household data reported below and the system of land tenure it is important to appreciate the broader social structure of society in the Karak region. Archaeological data shows that there

has been settlement in this area for millennia and the social groupings are anciently established. There have, however, been a number of significant migrations in relation to the Palestine situation and communities that moved into this region in 1948 and 1967 have added to the complex mixture.

3.6 Tribal affiliation still remains a major organising principle of society in the Karak region. A partial listing of the more than eighty tribal groups encountered by the survey is given in the Annex. Figure 2 graphs the percentages of interviewees affiliated to major tribes.

Figure 2. Dominant Tribal Affiliations in the Karak Region



3.7 The terminology of tribal affiliation remains in dispute, but usually settled people are considered to belong to *ashir* and Bedu to *qabila*. However, *ashir* is also used for large groupings of Bedu. Each of these are divided into lineages and families.

3.8 Different tribes have access to more or less political power, following dispositions probably established in the Ottoman era. As a result, there has been an accumulation of land ownership in the hands of the a few major families. No figures are available, but at least half the land in this area is probably owned by such powerful lineages. These owners usually live in major towns, Karak, Tafila or Amman.

3.9 Below the owners in the social hierarchy are the landowning farmers. The landholdings of such farmers are enormously variable, but almost always land was acquired through family inheritance. Often such farmers are retired from the civil service, which is pensionable for males after twenty years. This gives them time and some capital to return to family land and take over the farming business.

3.10 Landless farmers are most common in the *ghors* and the wadis. Known as 'guarantors' in local English, they effectively stand between owners and labourers. They make contracts with owners to manage the farming of the land and also are usually responsible for obtaining inputs. They then find labourers who will actually work on the land. Indigenous landless labourers are quite rare in this region except in the *ghors* where

Traders

3.11 The main channelling of trade in the region is through an important merchant class, usually associated with the powerful families. Traders stand between producers and the central markets for almost all major crops except those bought by government. Many farmers are permanently indebted to the large-scale wholesale traders who provide cash at the beginning of the season to buy crop inputs.

Bedu

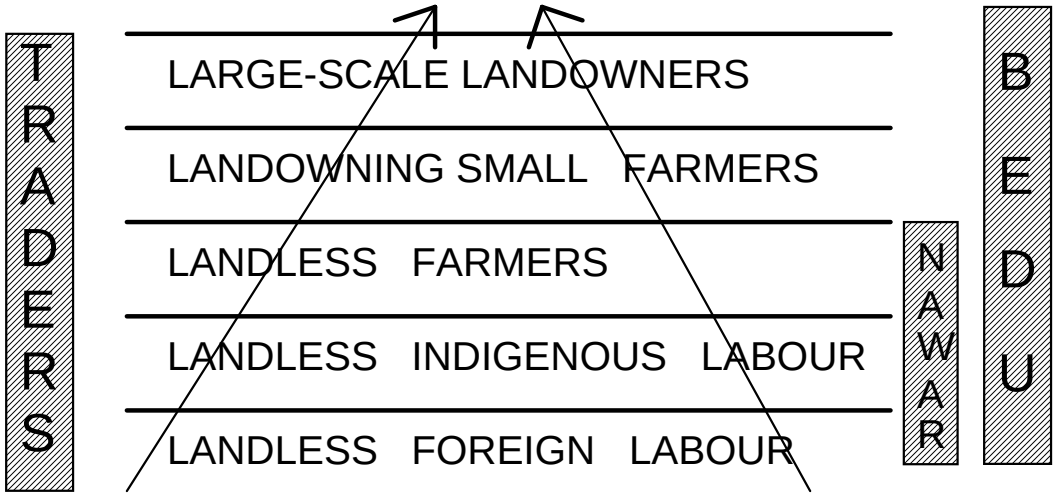
3.12 Livestock production in the rangeland areas is largely in the hands of the Bedu (Bedouin). Although sharing many cultural features with the settled populations, *fellahin,* their distinctive systems of production set them apart. Tribal affiliations until recently have constituted the single most important organising principle in Bedu social organisation, defining livestock production strategies, patterns of migration, marriage and warfare, as well as access to pasture.

Nawar

3.13 Apart from the Bedu, there are also Nawar, or Gypsies. Of ancient but unknown origin, the Nawar represent a mobile group of craftspeople who move from place to place selling handicrafts, like Gypsies in Europe. Somewhat secretive, their society has never been described.

3.14 Figure 3 represents the approximate social structure of the Karak region in graphic form.

Figure 3. Social groupings in the Karak region



C. Household Structures and Labour Availability

Size and Structure of Households

3.15 The size and structure of households is not an easy variable to analyse because of the complex relations with collateral branches of the family. In addition, the widespread phenomenon of labour migration has led to large numbers of individuals being regarded as part of the family and yet not being functional members of the household. In addition, those in higher education are usually present out of term and thus occasionally contribute to the labour pool. Householders were asked for members of the family present and also those. Results for this part of the survey should therefore be taken as indicative rather than absolute.

3.16 Table 1 shows the mean household size for the entire survey, analysed by agro-climatic region. Male and female means are also given.

Table 1. Mean household size, male/female and total				n=366
Region	**n**	**Male**	**Female**	**Total**
All	366	4.9	4.6	9.5
Plateau	120	5.1	4.6	9.7
Wadi sides	148	4.7	4.6	9.2
Wadi bottoms	29	5.2	4.0	9.2
Ghors	69	4.8	4.8	9.7

3.17 In view of the widespread prevalence of multiple wives it is surprising that men persistently outnumber women. This could be a memory error; male informants are more likely to 'forget' female children when enumerating their household. Alternatively it could reflect the outmarriage of daughters who leave the household and perhaps the area. Table 2 shows the frequency of the marital status of household heads as reflected in the sample.

Table 2. Marital Status of interviewees		n=366
Status	**n**	**%**
Husband	322	88.0
Housewife	17	4.6
Widow	11	3.0
Unmarried man	8	2.2
Unmarried daughter	4	1.1
Divorced woman	2	0.6
Second wife	1	0.3
Deserted woman	1	0.3
Total men	330	90.2
Total women	36	9.8

3.18 Within the household, the balance between children and adults can be very variable. With improved primary heath care, families are now very large and mother with more than 10 children are not uncommon. A young household, centred round a couple and their children may consist largely of children. By contrast, a pensioner with grown-up children who have left home may have a small household, unless his married sons live with him. Table 3 shows the ratios of adults to children in the different regions of the survey.

Table 3. Household composition				n=366
Region	**n**	**Adults**	**Children***	**Ratio**
All	366	7.4	3.4	2.2:1
Plateau	120	6.0	3.6	1.7:1
Wadi sides	148	9.2	3.1	3.0:1
Wadi bottoms	29	6.4	3.1	2.1:1
Ghors	69	6.0	3.8	1.6:1

*For the purposes of the survey children were considered to be those under 14 years

The age of the household head indicates another very important variable in terms of the pattern of household work. In many settlements, household heads are pensioners; i.e. after working 25 years for the Government or an enterprise they are supplementing their farm income with a regular monthly payment. Very often, for example if they have been in the army, they can get a housing loan on very favourable terms which is deducted at source from the pension. This situation explains otherwise quite poor families apparently living in large and well-appointed houses. The mean age of all the household heads in the sample was 53.2 years which reflects rather strongly the prevalence of 'retired pensioner-farmers'.

A consequence of the high mean age of household heads is an unwillingness to invest in farm improvement. Such pensioner-headed families are very often low in liquid capital and with the psychological support of a regular income, see no need for a farm to produce more than enough to feed the family and perhaps make a small profit. The age structure of such households is often such that the younger sons have grown up and gone away to work or are married with a separate establishment and so are not creating pressure for farm improvement.

Capturing labour availability is made more problematic by the social definitions of work. For example, university graduates, even when long-term unemployed, are often considered as unsuitable for agricultural labour even when they are perfectly fit. They can therefore stay around the house, in contrast to siblings without the benefit of tertiary education who must continue to labour in the vineyard. Many reasons were given for inability to work, ranging from education, health and Islamic prohibitions on wives. Table 4 shows the total households, the total numbers within them who are defined as available for agricultural labour and the total number physically present.

Table 4. Household labour availability **n=2708**

Region	Can work	% Total	Present	% Total
All	1863	68.8	2012	74.4

n=total adults sampled in survey

Labour availability

In subsistence systems, labour availability in particular, the presence or otherwise of household members constitutes a major constraint on agricultural expansion or intensification. The inability to mobilise more than a limited number of hands at harvest or during land preparation reduces the area cropped.

This is *never* the case in Jordan. The major reason is that because of the hard currency represented by the Jordanian Dinar, Jordan is able to attract cheap labour from neighbouring countries. Such labour can be recruited and paid for on a daily basis and in particular can be available at harvest time without imply any further commitment. A study of expatriate labour in the rangelands, showed that shepherding is dominated by Syrians and Iraqis (Blench, 1995). However, in the agricultural areas of Jordan, Egyptians appear to predominate, followed by other nationalities, such as Pakistani.

Recruiting labour

Labour can be recruited in extremely diverse ways, each appropriate to a specific economic or ecological niche. Broadly speaking, farm labour was recruited through sharing contracts in the past, but this has gradually been replaced by cash payments. In the case of shepherds, for example, there was previously an arrangement, *matteye*, or 'partnership' where the shepherd was entitled to a share in the produce of the flock. This could be as a form of charity to poor households or as a practical means of getting animals managed for civil servants. This system, which is a structural equivalent of share-cropping, is no longer practised in this region.

The disappearance of this system and its replacement by a simple payment of wages is in part due to the advantageous exchange rate. Households with large herds hire shepherds to manage their herds. Giving a shepherd actual animals would be relatively expensive compared with the amount a Syrian shepherd would accept in Jordanian dinars. The shepherds are available because they come from countries where an unstable exchange makes payment in Jordanian dinars an attractive prospect.

This process of internationalisation of the labour market has also acted to replace various exchanges of labour. One of the mechanisms of recruiting labour at peak times for farmwork was the use of rotating

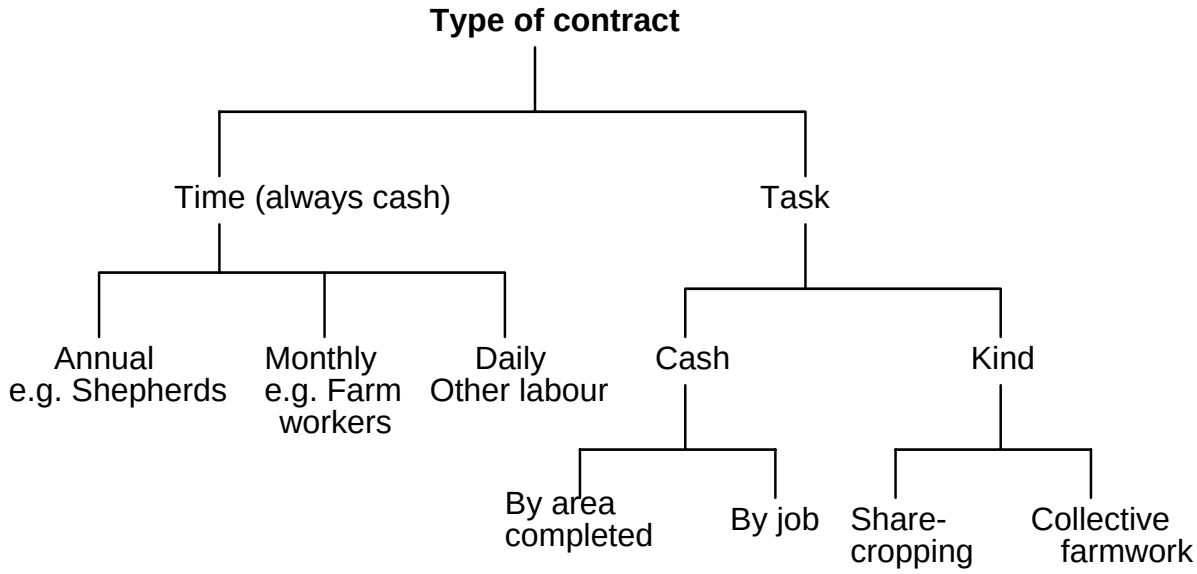
labour groups. In these, a group of farmers within a village agree to work on each others' farms at harvest time. They continue from farm to farm until the harvest is in. Such groups still function in some villages in the survey area, such as at Ash-Shqeik, but elsewhere they have been replaced by cash payments. One of the preconditions of rotating labour associations is that the majority of farmers are relatively young. As noted, many farms in this area are managed by pensioners, whose ability to work in such a group would be limited. The influx of cheap labour from neighbouring countries thus comes at a time appropriate to fill the gap left by the breakdown of collective systems.

Apart from longer term contracts with shepherds, and monthly contracts with farmworkers on larger estates, the majority of work is carried out by daily labourers. Rates of pay seem to vary according to the perceived socio-economic status of the labourers, their gender and the difficulty of the terrain. The worst daily rates are in the Ghors, where men are paid JD3 and women JD 2.5. Further up the wadi, men are paid JD5 daily and women JD3-4. This higher rate is said to be because of the difficulty of working the soil.

Alternatively, there are contracts with labourers by the dunum. This was only recorded in the Plateau areas, far from the wadi, where the terrain is even and extremely similar from one place to another. In such as case, work on a fixed area of land can be multiplied by the area without an unfair burden on the labourer. In the same area, some landowners gave fixed tasks to labourers for an agreed sum to be completed in their own time.

Figure 4 classifies the different types of labour recruitment in this region.

Figure 4. Types of labour contract in the Karak region



Categories of Households in the Project Area

The households encountered in the survey can be broadly classified into eight types, described briefly in Table 5. Those set off in a Helvetica type-face are not considered appropriate in terms of the target group of the present project.

Table 5. Classes of householder in the Karak/Tafila region

Category	Description
Owner	Landowner. Either resident in main towns or engaged in non-agricultural business.
Civil servant/ salaried worker	The male household head is away much of the time with employment and a small home farm is managed by the wife or other resident males.
Smallholder	Lifetime resident, owning at least some land and usually renting additional land

Pensioner-farmer	Former civil servant or urban resident returning to home area with an income from pension and usually a loan to build a new house
Guarantor	Resident, perhaps owning some land but whose principal business is to arrange for the cultivation of the farm of an owner
Landless labourer.	Usually working either for daily cash payments or carrying out share-cropping contracts
Expatriate labourer.	Usually Egyptian in this region.
Bedu pastoralist/ Nawar Gypsy.	Moving through the region in tented camps

Below two case histories of the types of household found in this region are given to try and make the above classification more concrete.

Case History 1. A landless labourer in the Ghors

Ali B. is a landless labourer in a village on the shores of the Dead Sea. He lives in a ramshackle one-room house with a lean-to roofed with palm leaves. He has a wife and five children under 10 years old. Apart from mattresses, the principal furniture in his house is a television, powered by an unauthorised branch on his brother's line.

He receives twenty-five Dinars monthly from social aid, but otherwise his only employment is share-cropping on a tomato farm. He receives 25% of the wholesale price when the crop is sold in exchange for doing all the work cultivating the crop. Last year this amounted to JD200. However, of this, JD175 was owed to the landowner in repayment of a pre-season loan. Ali B. is probably JD2000 in debt to various bodies and sees no means at hand to escape the increasing burden of debt at any time in the future.

Case History 2. A pensioner-farmer near Karak

Mohammed B. is a householder, 52 years old living in a newly-built house in a small village on the side of the wadi near Karak. He worked as a civil servant for 25 years before retiring. He has a pension of some JD120 a month of which JD30 is taken at source for his housing loan.

He has reclaimed family land and has begun to farm a part of it, using hired Egyptian labour. One of his sons lives in the house with his wife and children, while his other children have moved away to the city. He keeps seven sheep, has a few dunums of olives and otherwise grows principally fruit in a small orchard. His wife processes the olives and milk from the sheep for household consumption.

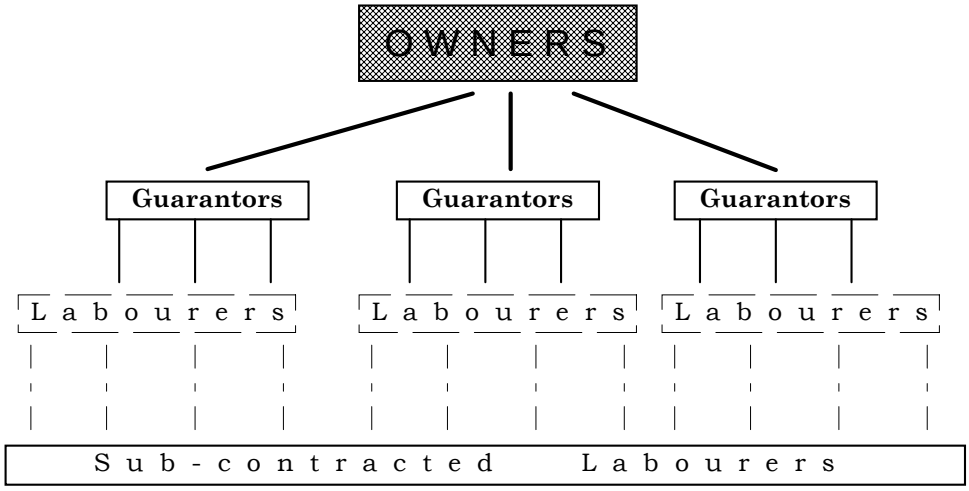
With his pension and the produce of the farm and money sent by his children working outside he can live reasonably comfortably. Although there is some erosion on his farm and the stone-terraces are in poor condition, he has neither the energy nor the motivation to rebuild them.

Social organisation of agricultural labour

Access to land is dealt with in the Section on access to land (p. 26), but the organisation of labour is so intimately bound up with the social pyramid that it is considered here. The single most important mechanism for working the land is share-cropping, *sharika*. Share-cropping, classically, is a contract between owner and labourer where the individual who carries out the work is allowed the profits from a fixed percentage of the crop. Owners may have a wide variety of obligations such as the supply of inputs or the health of the labourer and his family. Alternatively they may eschew these obligations in exchange for passing over a larger share of the crop to the labourer. A very similar situation has been described in the North Jordan Valley by Pollock (198x).

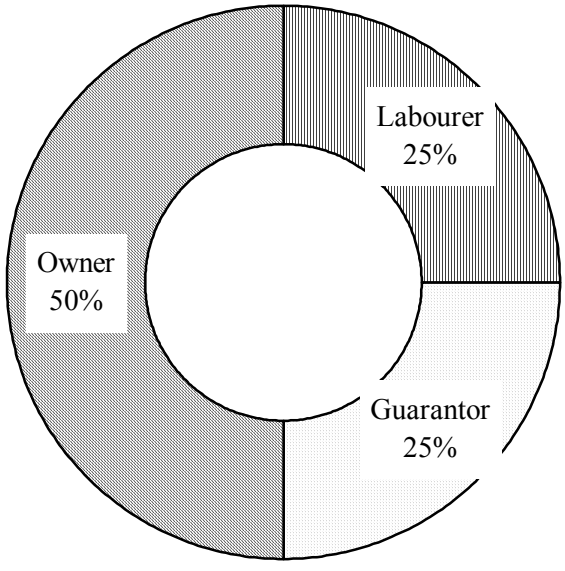
In the Jordanian situation, these relations are further complicated by the intermediate guarantors who recruit the labourers. Labourers in turn may find additional workers and establish subsidiary sharing agreements. Figure 5 shows this set of relationships.

Figure 5. Relations between land-owners and landless labourers



Financially speaking, the prevalent agreements are those where the contractors share the proceeds equally. This leads to a practical division of profits as shown in Figure 6.

Figure 6. Typical share-cropping agreements



These types of agreement are entirely weighted in the owners' favour, since there are virtually no costs to owning land where you do not make investments. In the case of monocrops such as the tomato, risks from disease or water shortages are quite common, although profits are correspondingly higher. However, the risks fall entirely on the guarantor and the labourers.

In recent times there has been some attempt to reweight these contracts in the light of the financial obligations of the contractors. For example, in areas where the soil is expensive to work, or the land is inaccessible, guarantors give the owner only 25% of the crop. Similarly, in contracts where the guarantor supplies all inputs, an analogous weighting is brought into force. Although among small landowners, monetarisation of both labour contracts

and land rent has now become prevalent, sharecropping remains the predominant system for large landowners. There is no incentive to change as the system works in their favour.

Quality of Life

Then quality of life in this region can only be assessed indirectly through two measures; income proxies, the material markers of prosperity and access to infrastructure.

Standard of living: Income Proxies

The diverse nature of householders' priorities makes the use of income proxies somewhat problematic in estimating standard of living. An indicative survey of vehicles and other possessions was undertaken. However, the boom in housebuilding throughout all this area suggests the size and furnishing of houses would be a better indicator. Even so, houses are usually built on credit from the Housing Bank and many farmers saw repayment as problematic (See p.35 on rates of indebtedness). Table 6 and Figure 7 show the number and percentage of farmers with specific income proxies.

Table 6. Income proxies		**n=366**
Households with	**No.**	**%**
Radio	309	84.4
Television	322	88.0
Plough	153	41.8
Bicycle	12	3.3
Motor-bike	6	1.6
Pickup	71	19.4
Tractor	27	7.4
Lorry	3	0.8
Water-tank	22	6.0
Car	19	5.2

Figure 7 . Farmer households with specific income proxies

Table 7 compares the ownership figures for vehicles with pastoralist households in the Jordanian rangelands (data from Blench, 1995).

Table 7. Percentage households owning vehicles				1995
	In Rangelands		In Karak	
	n=664		n=366	
Vehicle	n	%	n	%
Pickup	234	35.2	71	19.4
Lorry	93	14.0	3	0.8
Water-tanker	66	9.9	22	6.0
Tractor	75	11.3	27	7.4
Car	15	2.3	19	5.2

Although pastoralists clearly must depend more on vehicles than farmers, the gap between the two groups is still very striking.

Access to Infrastructure

Compared with many developing economies, Jordan has an impressive record of supplying infrastructure to meet the needs of its citizens. Even pioneer agricultural communities in the western rangelands are quickly supplied with roads and utilities and well-established settlements such as those studied in this report generally have access to infrastructure, with the exception of veterinary clinics. Table 8 shows clearly that the majority of the farmers interviewed were well supplied with common infrastructure with the single exception of veterinary clinics.

Table 8. Existing Community Access to Infrastructure		n=366
Responses	**No.**	**%**
Tar roads	299	81.7
Running Water	334	91.3
Electricity	344	94.0
School	360	98.4
Clinic	308	84.2
Veterinary clinic	85	23.2

This is not to say that the situation could not be improved; farmers were asked what infrastructure they would like to see in place. They were allowed to answer freely to assess their priorities and the results are given in Table 9.

Identifying Poverty: the IFAD Target group

It should be clear from the above discussion that the poorest group in society in the Karak region are the Egyptian and other expatriate labourers who provide a flexible pool of labour to work the land. These individuals, without a stable base cannot form the basis of an intervention.

Indigenous landless labourers form a relatively small class and are usually enmeshed in debt traps. They live on casual work from contract to contract and have means of investing either capital or labour in improving the quality of life of their household. Above these stand the guarantors who have no land but who are not necessarily poor. Some of the entrepreneurial guarantors in Ghor Safi appear to be quite wealthy to judge by income proxies. Farmers with small landholdings thus form the stratum of society who can be encouraged to invest in their future through investment. It should emphasised that the size of landholding is not an adequate criterion of poverty in this region, since some farmers who are specialised in livestock production on the Plateau have reduced their farm size to concentrate on stock production.

Table 9. Community Infrastructure priorities		n=366
Responses	**No.**	**%**
Nothing/no answer	103	28.1
Access roads	105	28.7
Electricity	31	8.5
Clinic	91	24.9
Veterinary clinic	90	24.6
Agricultural Extension office	59	16.1
Community Centre	35	9.6
School	31	8.5
Hospital	15	4.1
Mosque	7	1.9
Sewage system	3	0.8
Running water	52	14.2
Transportation system	35	9.6
Water conservation works	22	6.0
Anti-erosion works	6	1.6
Post Office	20	5.5
Anti-fire measures/Civil Defence	8	2.2
Telephone	5	1.4
Refuse collection	5	1.4
Tourist Facilities	1	0.3
Bank	2	0.6
Agricultural Storage Facilities	9	2.5
Court	1	0.3
Agro-industrial factory	9	2.5
Police Station	2	0.6

D. Farming Systems

Classification of Farming systems

The farming systems in the Karak/Tafila region essentially follow the agro-climatic zones and more specially the altitude. There are four major types;

1.	Plateau	The high-altitude grasslands occurring along the spine of central Jordan
2.	Wadi sides	Dissected land on the sloping sides of the wadis
3.	Wadi bottoms	The trough at the bottom of the wadi
4.	Ghors	The marshy land where the wadi debouches into the Jordan Valley

This represents a fall in altitude of some 850m. The agriculture of the Plateau depends almost entirely on natural rainfall, but the other three farming systems benefit from accumulated water, either in terms of natural drainage or through irrigation strategies.

Crops grown

Crops

The crops cultivated in the Karak are extremely various as a set, although in reality the great majority are cultivated in very small areas and certain crops predominate. There is a small set of 'traditional' crops, such as the cereals six-row barley and durum wheat, the olive and certain pulses and a very large number of quite recent introductions.

Farmers' choice of crops is determined by two factors; the availability of Government subsidies and agro-climatic zone. Although all agriculture is effectively subsidised in some ways, staple crops are given special attention. 1995 prices paid for these crops are;

Crop	JD/Tonne
Wheat	165
Barley	125
Lentils	340
Chickpeas	400
Vetch	220
Tomatoes	50

The price for tomatoes is a floor price: in other words, if the price goes below this then government will guarantee to pay this. There are also a series of guaranteed prices for the somewhat smaller trade in certified seed.

Table 10 presents a synthesis of all the crops grown in the Karak region and an analysis of the numbers of farmers cultivating them. The table also includes a few crops that were reported grown but were not encountered by the survey. Crops such as the mulberry are widely represented by individual trees in orchards but are barely commercialised.

Table 10. Crops cultivated in the Karak Region	Farmers cultivating it last year		n=366
Crop	**No.**	**%**	**Mean area cultivated (dunums)**
Field crops			
Barley	197	53.8	56.7
Wheat	212	57.9	45.0
Maize	4	1.1	58.1
Pulses			
Lentils	49	13.4	16.3
Chickpeas	36	9.8	23.7
Vetch	29	7.9	20.3
Cowpeas	4	1.1	
Broad beans	16	4.4	
String beans	35	9.6	
Vegetables			
Tomatoes	94	25.7	
Cabbage	1	0.3	
Lettuce	-	-	
Squash	19	5.2	
Eggplant	32	8.7	
Cucumber	4	1.1	
Cauliflower	-	-	
Okra	15	4.1	
Onion	18	4.9	
Garlic	-	-	
Spinach	-	-	
Basella alba	-	-	
Turnip	-	-	
Radish	1	0.3	
Parsley			
Carrot	3	0.8	
Chili	10	2.7	
Snake-cucumber	7	1.9	
Jews' mallow	6	1.6	
Ground Fruit			
Melon	13	3.5	
Watermelon	3	0.8	
Banana	8	2.2	
Grape	117	31.2	
Tree-crops			
Olive	180	49.2	
Almond	8	2.2	
Pistachio	-	-	
Fruit-trees			
Citrus	8	2.2	
Apple	14	3.8	
Peach	22	6.0	

Table 10. Crops cultivated in the Karak Region	Farmers cultivating it last year		n=366
Crop	No.	%	Mean area cultivated (dunums)
Mulberry	-	-	
Fig	31	8.5	
Pear	3	0.8	
Guava	3	0.8	
Pomegranate	20	5.5	
Forage	181	49.5	

The importance of the subsidies on cereals and tomatoes is well illustrated by this table. The relationship with agro-climatic zone is illustrated in Table 11 for selected crops.

Table 11. Area of selected crops cultivated and relation with agro-climatic zone				n=366
	Mean area (dunums) of crop cultivated last year			
Crop	Plateau	Wadi sides	Wadi bottom	Ghors
Field crops				
Barley	41.4	36.9	11.2	5.9
Wheat	42.3	26.6	8.9	3.8
Pulses				
Lentils	3.0	2.8	0.5	0.0
Vegetables				
Tomatoes	1.6	0.9	5.6	13.6
Fruit				
Watermelon	-	-	-	0.1
Grape	1.0	2.8	6.2	0.0
Tree-crops				
Olive	6.0	5.1	n/a	0.0
Fruit-trees				
Citrus	0.4	-	-	-

Farmers were initially asked to estimate their sale prices from crops. However, the answers were extremely variable and it seemed unlikely that they could be used for mean calculations of income. There are two quite distinct reasons for this;

a) the prevalence of share-cropping arrangements and the pre-harvest debts incurred by farmers means that they are not always very clear about the absolute sum realised on a crop
b) since this is their major source of income they may be simply unwilling to let researchers know its full extent, in case it is used for tax purposes

As a result, it was thought more appropriate to use standard figures for both yields and prices derived from MOA data. Table 12 shows the mean yields from the mean cropped area indicated by farmers, the mean wholesale price and thence the mean value cropped. In all cases, the figures refer only to farmers actually cultivating that crop.

Table 12. Estimated yields and prices for crops (1994)

Crop	n	Mean yield (kg/dunum)		Mean wholesale price (fils)
		Irrigated	Rainfed	
Field crops				
Barley	197	350	100	175
Wheat	212	400	90	105
Maize	4			
Pulses				
Lentils	49		80	300
Chickpeas	36		70	350
Vetch	29			
Cowpeas	4			
Broad beans	16			
String beans	35	2200		530
Vegetables				
Tomatoes	94	3938	1034	212
Cabbage	1	3400		70
Squash	19	2000	450	230
Eggplant	32			150
Cucumber	4	7000		218
Okra	15	700	400	500
Onion	18	2730	550	170
Garlic	-	1800	400	330
Radish	1			
Carrot	3			
Chili	10	1800		270
Snake-cucumber	7			
Jews' mallow	6	3500		85
Ground Fruit				
Melon	13	2700	1000	160
Watermelon	3	2900	1000	100
Banana	8	3000		625
Grape	117	750	360	300
Tree-crops				
Olive	180	650	300	470
Almond	8	650	350	230
Pistachio	-			

Table 12. Estimated yields and prices for crops (1994)				
Crop	n	Mean yield (kg/dunum)		Mean wholesale price (fils)
		Irrigated	Rainfed	
Fruit-trees				
Citrus	8	3400	-	240
Apricots		700	350	430
Apple	14	1800	1200	580
Peach	22	1200	750	540
Fig	-	700	350	385
Pear	31	900	500	650
Guava	3	900		390
Pomegranate	3	1300	760	335

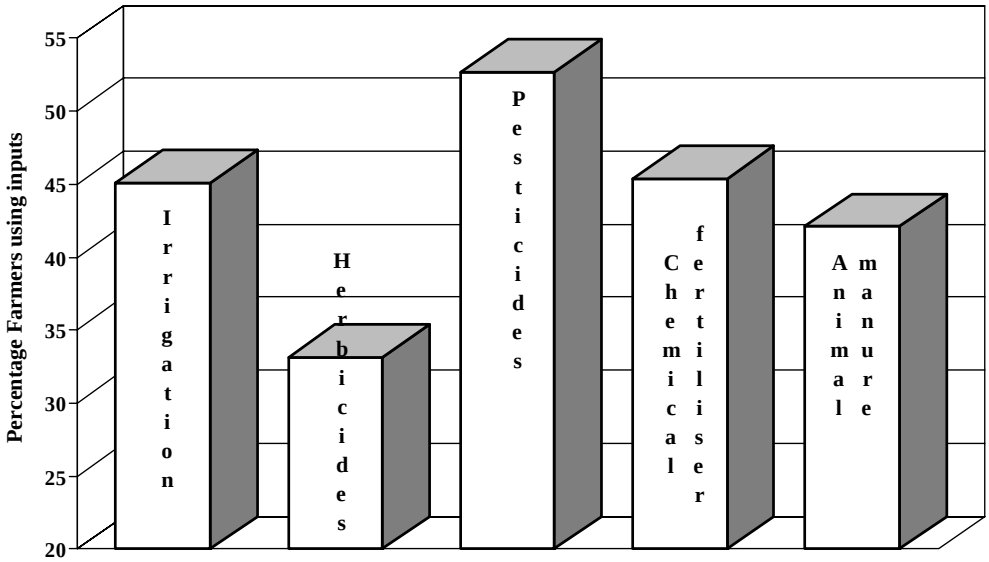
Source: Yields and prices from Ministry of Agriculture

Agricultural Inputs

This region has been generally characterised as a low-input farming region (e.g. IFAD, 1995). Farmers were asked about their use of the principal agricultural inputs. The number and percentage using particular types is given in Table 13.

Table 13. Farmers making use of agricultural inputs		n=366
Practice	Number	%
Irrigation	165	45.1
Herbicides	121	33.1
Pesticides	193	52.7
Chemical fertiliser	166	45.4
Animal manure	154	42.1

Figure 8. Farmers' use of inputs in the Karak Region



Irrigation comes in two types, 'traditional' and modern. Traditional means the channelling of natural rainwater coming down the wadi using channels. These would originally have been stone-lined but are now made of cement. Modern irrigation (*tif-taf*) consists on pumped water passing through a main pipe and sets of small rubber hoses set to drip on individual plants. Originally it was hoped to distinguish these two analytically, but in reality, many farmers use complex combinations of the two, using rubber hoses to augment cement channels and pumping water through hoses into old drains.

The use of herbicides remain relatively rare and most weeding is still done by hand. Pesticides are considerably more common and are freely available in small shops everywhere. Jordan only produces one type of chemical fertiliser, which is sold relatively cheaply. Other fertilisers have to be imported. Animal manure is principally from chickens and cattle and is sold at a rate of approximately JD100 per pickup. The manure gained by allowing pastoral herds to grazer on stubble is usually free in this area, though elsewhere in Jordan there are reports that the Bedu have to pay for this privilege.

Expenditures are extremely variable and some farmers seem to have over-estimated their expenditure in relation to their landholding. Table 14 shows the mean claimed expenditure. Some of the more doubtful figures have been eliminated.

Table 14. Farmers' expenditure on agricultural inputs

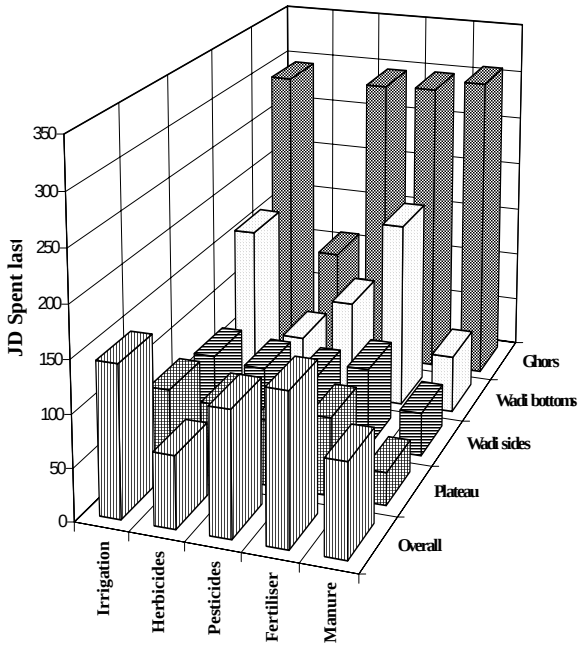
Practice	n	Mean expenditure, last year (JD) (n=366)
Irrigation	165	144.8
Herbicides	121	68.6
Pesticides	193	119.0
Chemical fertiliser	166	143.6
Animal manure	154	88.9

There is a strong correlation between region and expenditure on inputs. Essentially, farmers in the *ghors* spend the most and those on the Plateau the least. The reason for this relates quite simply to the certainty of water availability. Farmers in the *ghors* can depend on water, since it derives from pumps not from rain. On the wadi sides, water can almost certainly collect. On the Plateau, however, farmers are uncertain whether the rain will fall at all. It is therefore increasingly less attractive to invest in expensive inputs when there is a decreasing certainty of harvesting a crop. Table 15 shows the variation on expenditure on inputs by zone.

Table 15. Expenditure (JD) in 1994 on inputs by location

Location	Irrigation	Herbicides	Pesticides	Chemical fertiliser	Animal manure (n=366)
Overall	144.8	68.6	119.0	143.6	88.9
Plateau	77.4	70.4	63.1	74.9	31.3
Wadi sides	68.9	64.0	62.7	78.2	42.5
Wadi bottoms	159.4	54.6	97.6	184.3	56.8
Ghors	293.3	107.4	294.4	295.8	306.6

Figure 9. Expenditure on inputs by land category



Low-input farming is a rational economic decision under these conditions and not the result of lack of knowledge or availability of inputs.

Soil and Water Conservation Systems

Historical patterns

This region of Jordan has been extensively surveyed by archaeologists and one of their most significant observations has been the density and antiquity of soil and water conservation systems. Ancient field boundaries, disused cisterns and retaining walls are abundant along most of the wadis in this region and testify to a thriving agricultural system for a long period.

Present-day situation

The impression given in some of the literature is that erosion control systems are irrevocably in decline. This is far from being everywhere the case. In some wadis, such as Wadi Jedira, the retaining walls and contours and irrigation channels have been well maintained and are functioning as intended up to the present. However, in the neighbouring wadi, Wadi Kathroba, where the inhabitants of Ay and Kathroba are usually not farmers, anti-erosion works have been allowed to collapse.

Although erosion is visible in many places, it seems to rank low in farmers' priorities. Some 237 (65%) of farmers asserted that erosion was a problem, although those on the Plateau generally considered it of minor significance. Nonetheless, only very small numbers claimed to have taken any action. Table 16 summarises the strategies of farmers against erosion.

Table 16. Farmers' existing actions against erosion		n=237
Responses	**No.**	**%**
Built anti-erosion walls	13	5.5
Replaced with new soil	11	4.6
Land clearance/levelling by machine	6	2.5
Land contouring	4	1.7
Planting trees	2	0.8
Built drains for excess water	1	0.4

n is the number of farmers claiming erosion is a problem

The variability of tree planting between wadis is quite striking, with Wadi El-Hasa showing little or no trees and the Wadi El-Karak being lined with them. This is a undoubtedly a reflection of the activities of the forestry department which has a nursery in the base of Wadi El-Karak.

The use of bulldozers and excavators to clear and level land in the wadis is encouraged by government and in some areas these are available to farmers at subsidised rates. However, such large-scale operations are likely to be detrimental to the topsoil; by clearing stones and shrubs, they are likely to increase the scale of erosion.

Problems other than erosion

Salinity was essentially a problem only in the *ghors* and wadi bottoms. Many of them asserted that the problem was accentuated by the introduction of an irrigation system in the 1980s by the Water Authority. Typically, farmers close to the source had less problems than those at the end of the line. In the light of experience elsewhere with irrigation systems, farmers' views may well reflect the truth.

Low fertility is an evident consequence of the high pressure on land and the consequent decreasing fallow cycle. In the *ghors* many farmers use the land twice a year for summer and winter crops.

Patterns of ownership and access to land

Earlier reports imply that most farmers own their own land (e.g. IFAD, 1995 which gives a figure of 87% in Karak Governorate). This figure confirmed by the present survey, which showed that 322 (88%) of farmers owned some land. However, this statistic is rather misleading as much of the best and most valuable agricultural land in the *ghors* and wadis is usually not owned by those who farm it. Hence many farmers have a mixed strategy of low-intensity farming operations on their own land which may be former rangeland on the Plateau and share-cropping or renting wadi land for vegetables or fruit trees. Table 17 shows the various means by which land has come into the ownership of householders. Many farmers had acquired land through various means hence the figures come to greater than 322.

Table 17. Sources of claims to land ownership	n	n=322 %
Inherit	258	80.1
Bought	55	17.1
Leased from Government	11	3.4
Traditional claim	4	1.2
Others	16	5.0

n is the number of farmers owning land

In a sense, a table like this is misleading since the questionnaire was inevitably directed at farmers. Absentee landlords, living in large towns could not be sought out and questioned and the size and extent of their landholdings is thus unknown. Similarly, although occasional 'owners' were encountered, they frequently knew little of nothing about the farming of their land, and were content to receive payment from the share-cropper at the appropriate time. Similarly, landless labourers are probably under-represented in the questionnaires, since they were unable to answer the questions concerning farming practice, given the often discontinuous nature of their employment.

Renting land for cash is also reasonably common. Some 117 (32.0%) farmers were renting land for cash. Rates for land differ considerably from one plot to another according to the site, fertility of the soil and what crop has recently been on the land.

Land fragmentation

The sample was divided into farmers who own at least some land and those who own none but always rent or share-crop land for farming. The mean area farmed in the Karak region is usually about ten hectares. This is usually split into a number of plots. The reasons for such fragmentation are various; the inheritance system, the dichotomy between owned and rented land and the terrain. Table 19 shows the overall numbers of plots, mean plot size and also the variation between farming locations. The table shows mean land area farmed, as many farmers' holdings are a complex mixture of rented, share-cropped and owned.

Table 18. Overall landholdings Category	n	Mean area land farmed (ha.)	Mean no. plots	Mean plot size
Owning at least some land	322	100.6	3.6	27.5
With access to land*	353	95.7	3.5	27.3

* i.e. not simply labouring

Table 19 shows the degree of fragmentation of plots by land category.

Table 19. Fragmentation of landholdings Location	Mean area land farmed (ha.)	Mean no. plots	n=353 Mean plot size
Overall	95.7	3.5	27.5
Plateau	119.6	3.5	34.2
Wadi sides	104.8	2.3	45.6
Wadi bottoms	67.5	4.3	15.7
Ghors	32.6	1.7	19.2

n is all farmers with access to land

Although plots can be fragmented, it is not clear from the farmers' point of view how they can be consolidated in the wadis. Fragmentation is at low levels on the Plateau. Land consolidation has been undertaken in the regions served by the Jordan Valley Authority, including Kuffrein. The consequence is to create larger farms in fewer hands and to increase the dependency of landless labourers.

Agricultural Tasks and the Sexual Division of Labour

Agricultural tasks are not strongly sex-marked in the Karak region. Households were keen to emphasise that all members worked together to achieve the farm enterprise. Moreover, there is considerable inter-household variation. In some households the husband did not consider it appropriate that wives or daughters should be employed in farm labour, although it was considered acceptable to process farm products, particularly from dairying. Since men were the principal household heads (330 of 366 or 90.2%) Table 20 shows the percentage of men performing principal agricultural tasks.

Table 20. Men performing agricultural tasks		**n=330**
Task	**n**	**%**
Land preparation	190	57.6
Animal ploughing	146	44.2
Tractor ploughing	153	46.4
Application of herbicide	100	30.3
Choosing what crops to grow	182	55.2
Choosing what seeds to plant	187	56.7
Planting/sowing	250	75.8
Weeding	238	72.1
Application of insecticide	150	45.5
Pruning trees	161	48.8
Harvest tree-crops	139	42.1
Harvest field-crops, picking vegetables etc.	238	72.1
Threshing	176	53.3
Transport from farm to Household	192	58.2
Drying	12	3.6
Storage	92	27.9
Processing	21	6.4
Transport to market	150	45.5
Marketing	76	23.0
Feeding livestock	114	34.5
Herding livestock	89	27.0
Milking	27	8.2

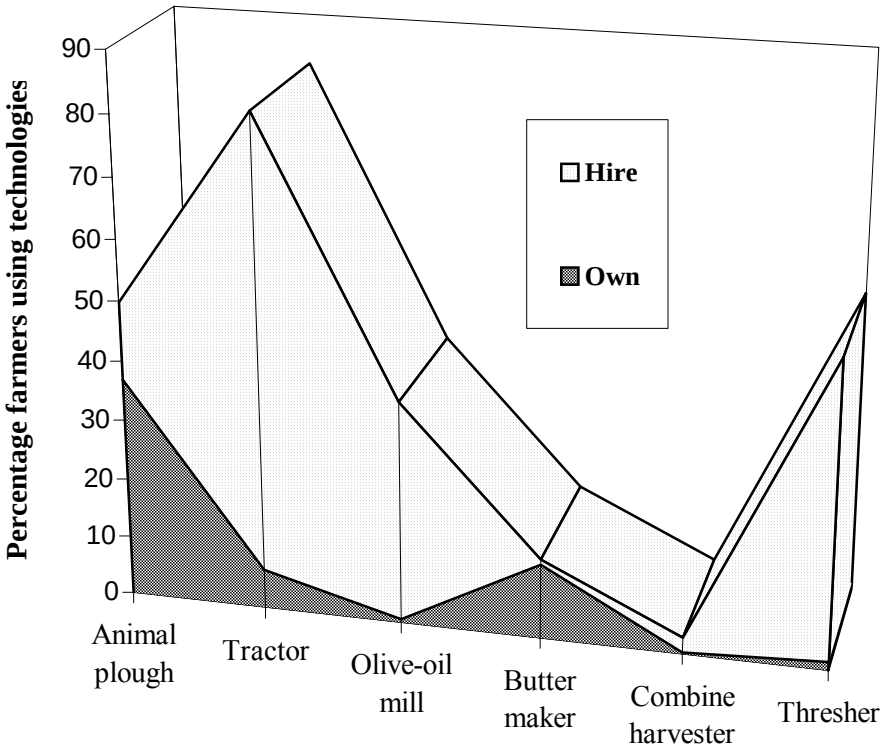
It should remembered that the majority of farmers in this region use some hired labour and furthermore hire tractors, or where they own tractors, drivers.

Agricultural Technology and Access to it

The prevalence of low-input farming in this region has led to the suggestion that there is a potential for introduction and expansion of agricultural machines. Farmers were asked what machines they used for both labour tasks and processing. In the event, farmers appear to be well informed about technology. In part this is due to the ready availability of machines through government-subsidised programmes. In addition, government fixes acceptable rates for processing activities such olive-crushing mills which encourage farmers to make use of them. Table 21 shows the numbers of households making use of machines and processing equipment.

Table 21. Agricultural Technology and Farmers' Access to it				n=366
Technology	**Own**	**% Total**	**Hire**	**% Total**
Animal plough	135	36.9	47	12.8
Tractor	24	6.6	276	75.4
Olive-oil mill	2	0.5	135	36.9
Butter maker	46	12.6	3	0.8
Combine harvester	1	0.3	9	2.5
Thresher	5	1.4	181	49.5

Figure 10. Farmers owning or hiring agricultural Technologies



Some of these technologies call for individual comment.

Animal-drawn plough.

Until the 1950s this was the only means of tilling large areas of land and farm sizes were presumably correspondingly reduced. Mules, donkeys, horses and cattle were formerly used to pull ploughs, but presently, the donkey is the favoured animal. The flexibility of the donkey-drawn plough and its ability to turn in tight spaces has led to it being kept for small or awkwardly shaped plots on wadi sides. Farmers usually retain the plough if they have land in this zone, though they hire tractors for larger areas of open fields on the Plateau.

Tractors

Tractors are usually hired from private contractors. The investment needed for a tractor, usually discourages all but large-scale farmers from buying such an implement. Even so, most hire out their tractors to render them economic.

Olive-oil Mills

Olives were previously crushed by hand in a long, tedious process. This has been almost entirely replaced by olive-oil crushers. These are large-scale operations only found in major settlements such as Karak or Tafila. The usual system of payment, fixed by law, at these mills is that the crusher takes one twelfth of the oil brought to the mill. Olive oil is usually enumerated in cans, each of which contains 17kg.

Butter-processor

This is no more than a type of simple domestic washing machine with a rotary motion. This can effectively replace the practice of swinging a goat-skin bag full of milk and save women, who are usually charged with dairy processing, a considerable amount of labour.

Others

The combine harvester, thresher and excavator are all available for hire at the following rates;

Machine	Rate
Combine harvester Thresher Excavator	

3.1 Generally speaking, farmers have good access to agricultural machines and there is no evidence that a lack of awareness is preventing their use. Indeed, the easy availability of excavators and bulldozers has led to their use on rather unsuitable sites on the sides of the wadis and there is some reason to think they are contributing to erosion.

F. Livestock Production

3.2 Although crop farming is the principal activity of householders in this region, the production of animals is an important secondary activity, especially in the Plateau regions. It is important to recognise that small landholding by no means always betoken poverty. A farmer with 10 dunums may have 200 sheep. The following section describes the basic species of animal kept in this region.

Livestock Species

Sheep

Sheep Breeds

Baladi/Awassi

3.1 The principal breed of sheep in Jordan is the Baladi or Awassi, a fat-tailed breed with a variable-coloured coat. Many animals are pure white, but brown and pied brown coats are also present. Resistant to cold, the Awassi is valued both for its wool and its meat, throughout the entire region. This makes it a valuable export animal. The characteristics of the Awassi have been described in detail in Epstein (1985).

Nejd

3.2 The Nejd sheep is a fat-tailed wool breed usually found in Saudi Arabia and regions further south. They can be recognised by the black wool and white head, an inversion of the more common blackhead pattern. They are reputed to be good milking animals, but to be much less resistant to cold.

Goats

3.3 The goats generally encountered in Jordan are the Baladi type. They have a highly variable coat colour, ranging from white through brown to black. Black goats are predominant in the southern areas. They have a long coat, which is usually clipped.

3.4 There are two other breeds found occasionally, the Shami and the Abrussi (Cyprus). Shami goats have a red-brown coat and are noted for their productivity. They are the focus of a pregnant doe sale programme promoted by IFAD and the Ministry of Agriculture. Some Shami goats were encountered but these still remain a small proportion of the national herd. Shami goats have a reputation for extremely high productivity but their greater susceptibility to local disease entrains higher veterinary costs. It is common to see a few Shami goats crossbred with local races to confer greater resistance to disease.

Camels

3.5 Camels were formerly the dominant species throughout the Jordanian rangelands. Camels have declined drastically in number and importance, although their symbolic significance remains strong. Camels are still kept in the pastoral areas of the Jordan Valley increasing in importance further south into Wadi Araba. During the season of stubble grazing they move along the wadis and are occasionally seen in small herds on the Plateau.

Cattle

3.6 The traditional breed of cattle is a small, humpless taurine usually brown in colour. This breed, the Baladi, has been almost entirely replaced by imported European breeds in the highland areas, but survives in some settlements in the Ghors and on the sides of the wadis. Cattle pastoralism has never been of importance in Jordan, and most of the other cattle kept in Jordan today are in intensive operations.

3.7 Presumably the reason for the survival of these cattle is their ability to tolerate the intense heat of region by the Dead Sea as well as to suggest the highly saline vegetation. They are usually kept as single milking cows for a family milk supply. Their potential seems to have remained virtually uninvestigated.

3.8 In the higher altitude regions, cattle were used extensively until recently as plough animals (See Lancaster & Lancaster, 1995). The spread of tractor hiring units seems to have rapidly displaced plough-oxen with no cases recorded in the survey.

3.9 Occasional exotic breeds are kept, single animals for their milk. They are probably not economic, as the high cost of both feed and veterinary services is likely to outweigh the value of the milk. Nonetheless, it was striking that a number of households proposed cattle production as an income generating enterprise (See Table 26).

Horses and Mules

3.10 Horses are now but rarely kept in this area, and very often for prestige rather than as an economic resource. However, the precipitous terrain on the sides of the wadis makes them a practical option for moving around in some areas. Moreover, it appears that until recently horses were kept as draught animals. They have been wholly replaced in this function by donkeys and mules. This is probably because the horses were only used the flatter terrain on the Plateau proper before the advent of tractors.

Donkeys

3.11 Although their absolute numbers are small, donkeys are essential to the production system of small ruminants. Farmers keep donkeys as both transport for small items and to help lead sheep and goat flocks. In many farms on the hill sides, donkeys are the principal animal used to pull the plough. In contrast to horses, the use of donkeys has not declined in the face of mechanised transport. This is in part a reflection of their hardiness, unspecialised diet and their surefootedness in difficult terrain.

Pigs

3.12 Pigs are kept in the Christian villages of Hmud and Smakiyyeh. Although only one holding was recorded in the survey, there are a number of units in these villages supply hotels in Amman. These appear to be quite a recent innovation and the pigs are all imported European breeds.

Poultry and others

Poultry

3.13 The main species of poultry kept in this area are chickens, turkeys, pigeons and geese. Ducks are also know though not recorded in the survey. There is a small amount of intensive chicken production with units of 1000 and more, supply both Amman and other urban centres.

3.14 Backyard poultry production is not a high-status activity, and male interviewees frequently professed to be unaware of the numbers and types of birds kept. However, poultry-keeping is an important minor source of both income and protein and appears to on the increase.

Rabbits

3.15 Rabbits are a relatively recent introduction, but a few households were recorded keeping them and they appear to be becoming more common. One case of a sub-industrial unit was recorded. There is a minor trade in rabbit fur for shawls and rugs.

Beehives and Honey Production

3.16 One of the least known aspects of livestock production in the Karak region is the prevalence of beehives. Honey is a prestigious food in Jordan but most of that available in Amman is imported. Nonetheless, honey production is a traditional activity in the wadis south of Ibn Hammad, and has apparently been so for a long time, since there are Ottoman records of tax on honey production.

3.17 Hives were traditionally made of clay and some of this type still survive. However, they are generally reckoned by producers to be rather inefficient, perhaps because it was difficult to remove the comb without driving away the swarm. They have been largely replaced by various types of wooden box hive, a 'new' type spreading only recently.

3.18 Honey production is quite popular and honey can sell for up to 15JD per kilo. However, yields are very variable, from 1-10 kg. per hive, according to producers. Producers take no sanitary precautions and complained that they receive no advice from the Agriculture Department. Foul brood (*farwa*?) is an occasional problem and there was a regional outbreak a few years ago which led to a significant reduction in the number of producers.

3.19 The farms on the wadi sides appear to be the major beekeeping areas. This is probably a reflection of the more diverse flora which survives in the inaccessible slopes of the wadi. Some producers living on the Plateau proper also kept bees, but they suffered from a high mortality attributed to agro-chemicals. There is no marketing system for honey and no quality control. As a result, the industry is far from reaching its potential in this region. Honey is also produced in the Irbid region and the QAF has had some success with an extension project among producers.

Ownership

Livestock ownership in this region is extremely variable. In the Ghors, many farms kept no animals at all, whilst on the Plateau it is common to keep at least a small holding of sheep or goats. In the wadis, farmers commonly keep only draught animals. Table 22 shows the number and percentage of farmers keeping individual species and the mean size of holding calculated for those farmers.

Table 22. Ownership of livestock			n=366
	Mean no. households with this species		Mean size of holding
Species	No.	%	
Sheep	121	33.1	50.4
Goats	151	41.3	18.9
Horses	17	4.6	1.5
Mules	24	6.6	1.1
Donkeys	120	32.8	1.4
Cattle	11	3.0	2.3
Pigs	1	0.3	10.0
Chickens intensive*	7	1.9	4714.0
Chickens backyard	114	31.1	13.9
Geese	3	0.8	1.7
Turkeys	8	2.2	2.0
Rabbits	17	4.6	8.0

*Units of 1000+

**Excluding one sub-industrial rabbit unit of 400

Notes:

No camels were recorded, although camels are regularly seen in this area in the hands of Bedu. Beehives were only systematically recorded part-way through the survey: an estimate on the basis of incomplete data suggests that there might be 50 households keeping bees in the sample.

To set these figures in perspective they should be contrasted with those recorded for the pastoral Bedu. Table 23 shows mean holding size for this survey and for Bedu in the rangelands (from Blench, 1995).

Table 23. Livestock holdings: farmers and Bedu compared		
	Mean size of holding	
Species	Farmers	Bedu
Sheep	50.4	296.8
Goats	18.9	38.6
Horses	1.5	1.3
Donkeys	1.4	1.5

In both cases, means are taken over the sample of farmers owning this species

This illustrates rather neatly that the imperatives for keeping donkeys hardly change with herd size, whereas mean holdings of key pastoral animals are much increased in the scheme of subsistence.

Production Systems

Sheep and Goats

In the Karak region, small ruminants owned by farmers are usually kept penned for most of the day in a small enclosure next to the farm. Their feed is brought to them, either purchased imported barley or cereal and vegetable residues. If the farmer has school age children, the animals may be taken out to graze the wadi sides. On the Plateau proper, they animals can be allowed out after the growing season.

The great majority of animals in the region are kept by the pastoralists, usually Bedu[3/], who range East-West along the wadis. There are series of migration patterns that move from the intensive vegetable cultivation in the Ghors, up the wadis exploiting the natural vegetation and onto the stubble fields after the cereal harvest on the Plateau. The major species in many of these herds appears to be the goat, perhaps because of the precipitous hillsides on which the flocks graze.

Goats do, however, have a number of advantages;

a) They produce milk for 6-7 months as opposed to sheep which only lactate for 3-4 months. They are often kept for milk to drink as opposed to milk for sale.
b) They can eat a much wider range of vegetation including woody perennials which sheep cannot digest
c) They are less susceptible to disease than sheep
d) They are more intelligent and thus less likely to get lost. In consequence, goats are often used as castrates, *mereeya*, to lead large sheep flocks.

Intensive Livestock Production: problems and prospects

Although only a minority of farmers actually do keep small ruminants on an intensive basis, they are a popular option for generating additional income. Still, it is likely that the major constraint on increased production is not capital to buy breeding animals but labour to manage them. Livestock are much more susceptible to economies of scale than crops; it takes virtually the same labour to manage fifty animals as thirty. For this reason, the owners of substantial herds on the Plateau invariably employ hired shepherds, usually Syrian, as do their Bedu counterparts.

Unlike pastoralists, farmers are not constantly with their animals and so they are in greater need of an effective veterinary service to keep them healthy. Moreover, the greater degree to which the animals are penned in what is a high rainfall area also increases the incidence of certain diseases. However, unfortunately, veterinary services are nearly unavailable for most of the farmers of this region (Table 8). Given this situation, it is impressive that there are so many farmers keeping small ruminants. The same is true for cattle: the high cost capital cost of cattle must be weighed against the problems of finding effective veterinary treatment.

Feedlot production of sheep and goats depends substantially on both the labour resources to manage the animals and the availability of cheap feeds. Until recently, imported cereals of animal feed were subsidised by Government. This subsidy has all but disappeared, making the economics of keeping small ruminants very doubtful without access to free feed in the form of range. It is likely that economic analysis would show that it is more cost-effective to allow Bedu, with their much larger herds and consequent economies of scale, to remain occupationally specialised small ruminant producers.

F. Marketing

Marketing of crops other than those purchased by government for subsidised prices is frequently a problem for farmers who depend on crop sales. Pensioner-farmers often consume most of their produce within the household and treat sales of additional crops as extra income; hence they are not exercised by problems of marketing.

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[3] Unfortunately, little or nothing is known about the pastoral Bedu of this region. Two studies, are however, forthcoming: a study of the Bedu using the Dana Reserve being prepared under the auspices of the RSCN, and an extension of the dataset of the IFAD Jordan Range Rehabilitation Project Baseline Socio-economic Survey of the Bedu from Wadi Karak down into the Wadi Araba. Unfortunately, the analysis of neither of these was ready in time for integration with the present report.

The single most important problem is the focus on Amman. Karak has a wholesale market of sorts but with a very limited throughput. There is no market except Amman for the vegetable production in the ghors. The consequence is that each individual producer is obliged to go to Amman and sell his produce which is costly and highly inefficient. Table 24 summarises the marketing problems cited by farmers.

Table 24. Marketing problems perceived by farmers		**n=366**
Responses	**No.**	**%**
Low prices for crops	116	31.7
No wholesale market	58	15.9
No/few farm roads	21	5.7
Gulf War caused external markets to decline	8	2.2
Problems marketing minority crops	5	1.4

G. Credit

Rural credit may be described as an old story to the farmers in the Karak Tafila area. All farmers have at least access to credit, although a number have refused it either for religious or economic reasons. The most common source of credit is the Agricultural Credit Corporation and the Bank. Almost certainly the single most important reason for borrowing money was house construction.

Farmers were also asked if they were in debt, i.e. had contracted loan arrangements in the informal sector. Many were not willing to explain exactly what these arrangements were, but nonetheless half the farmers were indebted in this way. Table 25 summarises the indebtedness of farmers and the sources of credit.

Table 25. Farmers and credit		**n=366**
	No.	**%**
Householders who have contracted credit arrangements	224	61.2
Householders presently in debt	183	50.0
Sources of Credit	**No**	**%**
Bank	67	18.3
ACC/JCO	122	33.3
Friends	16	4.4
Merchants	5	1.4
Others	12	3.3

There are probably more farmers indebted than the table shows, as many of the pensioners, especially ex-soldiers have loans deducted at source. This was frequently not perceived as credit in the same way as a positive act of applying for a loan.

Further credit within the context of a project is therefore problematic. Essentially, few farmers are willing to take on a further burden of debt unless either they perceive repayment conditions to be extremely favourable, or to be not enforced.

Income-Generating Enterprises

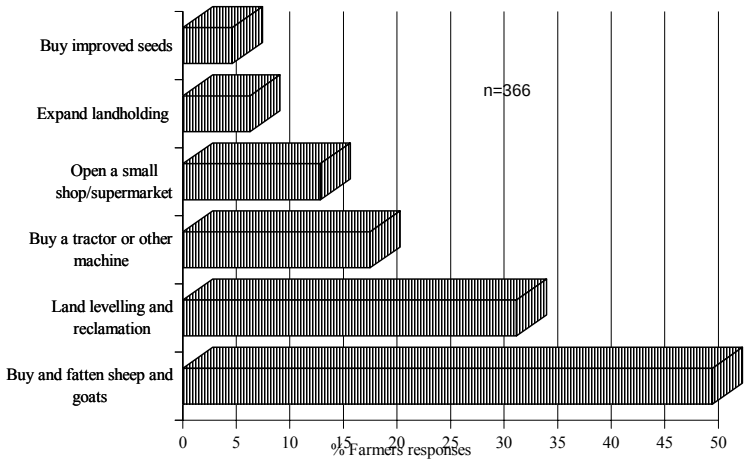
Although rural credit is definitely a doubtful enterprise for the reasons explained, it was still a useful exercise to explore farmers' notions about enterprises that could potentially increase household income.

Table 26 shows the different suggestions made by the heads of household and the numbers suggesting them. Each respondent could make multiple suggestions.

Table 26. Farmers' Suggestions for Income Generation		**n=366**
Responses	**No.**	**%**
Buy and fatten sheep and goats	181	49.5
Land levelling and reclamation	114	31.1
Buy a tractor or other agricultural machine	64	17.5
Open a small shop/supermarket	47	12.8
Expand/increase landholding through buying or renting	23	6.3
Buy improved seeds	17	4.6
Start a poultry farm	14	3.8
Start honey production	13	3.6
Establish a water-tank/reservoir	11	3.0
Would refuse a loan with interest as it is against my religion	10	2.7
Buy drip irrigation equipment	7	1.9
Cattle production (milk/meat)	7	1.9
Dig a well	6	1.6

It is notable that ruminant production and opening a small shop far outweigh all other suggestions. Sheep production is popular for reasons that do not necessarily relate to its economics. Sheep are prestigious and in particular are an offering to guests and are presented for weddings and other life-cycle ceremonies. A breeder of sheep who can present animals on appropriate occasions gains in the eyes of the community, regardless of whether the livestock enterprise is really profitable.

Figure 11. Most popular enterprises suggested by farmers



THE HASHEMITE KINGDOM OF JORDAN
AGRICULTURAL RESOURCE MANAGEMENT PROJECT
SOCIO-ECONOMIC BASELINE SURVEY: KARAK AREA WADIS

IV. FARMERS' PARTICIPATION

A. Environmental Resources and their conservation

4.1 The section on flora and fauna (p. 4) mentions the disappearance of tree species and the decrease of wildlife. The uprooting of trees in particular has had the unfortunate consequence of accelerating erosion. Only the extremely precipitous nature of the terrain has had the effect of conserving part of the natural flora, making possible continued honey production.

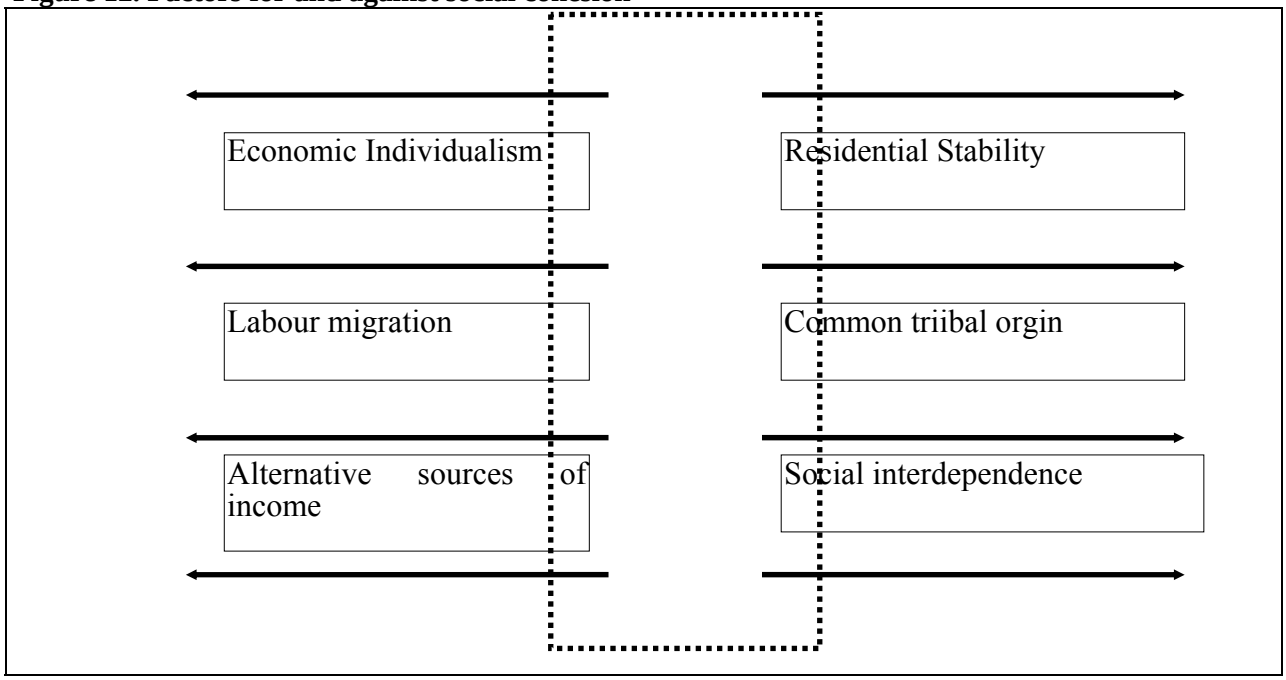
4.2 There is little or no evidence of any local consciousness of environment in this region. Indeed, the popularity of earth moving machines for land-levelling and the resultant expansion of farming into ever more difficult slopes suggests that the gradual elimination of the last vestiges of natural vegetation is not viewed with particular alarm.

4.3 Nonetheless, the wadis of the Karak region are remarkable both for their topography and vegetation as can be seen from the more intensive studies in Dana, slightly further south. Indeed the Dana initiative, studying ways of involving local communities in the conservation of their environment while continuing to make use of it, should contain valuable lessons for development initiatives in this area.

B. Participation and Community Involvement

4.4 One aspect of the present survey that comes out clearly is the gradual breakdown in social cohesion in the family and kin groups in the Karak region. This is probably inevitable in the light of modern economic circumstances. Labour migration has driven a large part of the younger work force out of the rural areas, and at the same time, increasing urbanism offers a wide variety of alternative means of making a living. The civil service system in Jordan, where pensioners retire after only twenty years has created a social structure where middle-aged individuals return to their natal area with an income and perspectives and links to the broader society. The need to work with other members of the community is much reduced and the affinity born of long familiarity is absent. Similar process have been noted recently among the Bedu pastoralists (Blench, 1995). Figure 12 attempts to represent some of these factors graphically.

Figure 12. Factors for and against social cohesion



4.5 An important consequence of this economic fragmentation is the breakdown of communal structures in villages. Table 27 conjoins householders' responses to a series of questions about participation. The most significant figure is probably the 17% of householders who are actually members of a community association. Expressing willingness to join in the abstract should not be confused with the results should such a scheme come to pass. It is also perhaps notable that only just over half the interviewees expressed any desire to join a community association.

Table 27. Householders' willingness to participate in community schemes

		n=366
Responses	**No.**	**%**
Householders who would join a soil conservation scheme	263	71.9
Householders presently members of a community association	62	16.9
Householders who would join a community association	204	55.7
Householders who would join a land consolidation scheme	178	48.6

4.7 Land consolidation has not had an encouraging record in Jordan. In Wadi Kuffrein it was carried out as part of the Jordan Valley Authority Development. The consequence was that the valuable consolidated plots rapidly fell into the hands of a very few owners and the other farmers were driven to marginal plots of rainfed subsistence at the edge of the region.

C. Extension and the role of government

4.8 One of the most problematic elements in any agricultural strategy is the proposed or actual role of government-sponsored extension. The evidence is that farmers in this region enjoy a high level of access to services compared with similar regions elsewhere. However, physical services, such as hiring machinery, are not linked to effective advice. Thus it is easier to hire an excavator than to get advice on whether its use will lead to dangerous erosion.

4.9 Extension services are controlled from the Agriculture Departments in the Governorates, but appointments are made directly from Amman. Usually extension officers are not specifically trained, but have agricultural qualifications. In the core Project Area there is a single extension officer outside Karak in

the village of Ay. In the extended region down to Wadi Tafila there is another officer in Imeh. Evidently, such sparse scattering of personnel can reach few of the farmers in the region.

4.10 Farmers were asked about their dealings with the extension service, essentially crops in most cases. Some 148 (40%) had had at least some contact with the extension service. Of these, 110 (74%) considered the outcome of the interaction broadly positive.

THE HASHEMITE KINGDOM OF JORDAN
AGRICULTURAL RESOURCE MANAGEMENT PROJECT
SOCIO-ECONOMIC BASELINE SURVEY: KARAK AREA WADIS

V. CONCLUSIONS AND RECOMMENDATIONS

A. Overview

5.1 The key findings of the baseline survey were that;

1. Much of the best agricultural land in the region is worked through a variety of short-term share-cropping arrangements. Since neither owners nor labourers take an interest in the land beyond annual profits this has entrained very poor land management.

2. The poorest stratum of society in this region is the expatriate day labourers. The existence of such a pool of cheap and flexible workforce has meant that labour availability is not a constraint on agricultural investment by landholders.

3. Low-input agriculture is concentrated in zones where rainfall is uncertain and cannot be supplemented by other water sources. The choice to eschew inputs is thus a rational economic choice and not a result of an information gap.

4. Landholdings are small, but the nature of the terrain in the wadis and renting/owning combinations restrict the potential for consolidation. Holdings are notably larger in the open land on the Plateau.

5. Restricted ownership and access to water in some wadis is highly controversial and has deterred farmer investment.

6. The system of official subsidies on major crops (cereals, tomatoes etc.) has had the effect of restricting the diversity of crops grown and bolstering uneconomic production methods. As a consequence, regional marketing systems are poorly developed with an over-emphasis on Amman. This has the effect of further discouraging trials with new crops.

7. Farmers appear to have good access to agricultural machinery, much of it available at subsidised rates. The retention of technologies such as the donkey-plough reflects the steep, inaccessible terrain not farmers' conservatism.

8. The status of soil and water conservation is highly variable from one wadi to another but is almost entirely determined not by presence or absence of technical knowledge but social conditions of land ownership.

9. The great majority of farmers in the region are permanently indebted both to informal sector lenders (landlords, middlemen) and parastatals. Increasing the availability of rural credit still further is unlikely to affect agricultural investment

10. Community associations are poorly attended and although just over half the farmers expressed a willingness to join in principle, economic individualism is very much the rule in this region.

11. Agricultural extension appears to have had little impact on farmers throughout the region

5.2 In the light of this, some elements of the proposed project may need to be reformulated.

Project Proposals

Credit

5.3 Far from being an unfamiliar situation, debts to friends, landlords, traders, banks and arms of government are an everyday reality for most farmers in the region. A willingness to take on further credit is thus strongly related to the perception of how effectively repayment will be enforced. If farmers perceive that loan conditions will be strictly enforced they will be unwilling to undertake them. A minority of individuals oppose any sort of loan where interest is charged on the grounds that this is contrary to Islam.

Recommendations

5.4 Recommendations fall into three categories:

a) suggested Project Area
b) implications for government policy
c) components suggested by the baseline survey

Project Area

5.5 The three northernmost Wadis in the proposed Project Area all unusual features of one type or another.

Wadi Kuffrein.

5.6 Wadi Kuffrein falls under the Jordan Valley Authority and is supplied by a dam, which is presently being enlarged. It is a wealthy area with large houses set among banana groves. Apart from being geographically remote from the other wadis, land ownership, agriculture and administration are quite different from those in the main Project Area.

Wadi Mujib/Wadi Wala

5.7 The principal affluent of the Wadi Mujib, the Wadi Wala or Wadi Heidan is used for urban water supply to Amman. This has had the effect of reducing the water supply and driving off the greater part of the farming community. High levels of mineralisation in the remaining water make farming difficult and efficient project implementation problematic.

5.8 The Wadi Mujib is also affected by the diminution of flow, however, it does support irrigated agriculture. Wadi Mujib is not permanently inhabited. All the arable land is owned by landlords from villages on the Plateau and worked either by share-croppers or by hired expatriate labourers. This situation is likely to deter investment in land improvement which would anyway assist wealthy landlords rather than the target group.

Wadi Ibn Hammad

5.9 Wadi Ibn Hammad has been selected for a long-term GTZ project focusing on the same issues as the proposed IFAD Project. No agreement for collaboration between IFAD and GTZ has yet been mooted. Until this situation is resolved there should be no further action on Wadi Ibn Hammad.

5.10 By contrast, the wadis south of Wadi El-Hasa appear to be promising within the terms of the proposed project. The wadis as far as Wadi Tafila (also Wadi Lagwera) have been investigated, but similar situations appear to occur as far south as Wadi Fidan.

Government Policy

5.11 Government should re-examine carefully the desirability of encouraging the use of large-scale earthmoving equipment on fragile areas of wadi sidewalls.

5.12 The policy of subsidising the prices of cereals and tomatoes is being re-examined as part of the IBRD ASAL proposals. Although subsidies are politically popular, they discourage farmers from innovation in both crops and livestock. If the subsidies are removed or reduced, alternatives for producers who are now heavily dependent on these crops should be examined. In particular, the incentives for producers to diversify are few although this would assist farmers in spreading risk.

5.13 The siting of agricultural extension services appears to be inappropriate to the needs of farmers. Given limited resources it seems that those which exist could be more effectively situated.

Project Focus

5.14 The target group of the project needs to be more strictly defined. The baseline survey has shown a highly complex social pyramid with the landless sharecroppers in the worst situation. However, these are precisely the class than cannot be easily assisted by credit and cannot participate in a programme of soil and water conservation. The project should therefore focus on farmers with small-to-medium landholdings who are not also substantial livestock producers.

5.15 The decline of conservation works in these wadis is a reflection of poor profits and restrictive practices that are a consequence of the land ownership system, not a result of lack of knowledge or interest on the part of farmers. Observations suggest that the more farmers control their own land, the more likely earthworks are to be maintained. In the light of this, the structure of the proposed project should be to facilitate the production and marketing of rural produce. If this is successful, then farmers will begin to invest further in environmental conservation without the need for direct intervention.

Project elements suggested by the baseline survey

Trade

5.16 Deteriorating land management is not a consequence of lack of technical knowledge but of a perception of the low and uncertain profitability of the farming enterprise. One element of this susceptible to immediate improvement is the regional marketing system. The enlargement or establishment of wholesale markets and the construction of rural access roads would assist farmers to bring crops to market and sell them locally, bringing about economies of scale in the transport to distant markets.

Rural roads

5.17 There is quite an impressive network of roads into some of the wadis, whereas others, including the wadi and the farms around Tayyiba, are poorly served. This is because the roads serve to connect settlements, some of which have very few farmers. A targeted programme of rural feeder road construction specifically aimed at the movement of farm produce would increase the profitability of remoter farms and encourage conservation works.

Crop Diversification

5.18 The present system also actively discourages farmers from experimenting with new crops. It is difficult for a regional farmer to liaise with specialised markets in Amman or other large towns. However, crop diversification is important both in terms of spreading economic risk and as hedge against disease.

Focus on honey production

Honey is a profitable product of this region whose potential is largely unrealised to due to a lack of centralised marketing, absence of sanitary measures and quality control. A simple project component would;

a Assist farmers with improved hives
b Disseminate simple information about packaging, marketing and quality control
c Develop a co-operative association to facilitate dissemination of knowledge and reduce costs
d Implement an improved health-care package

Small-scale flood-control works

5.19 In many wadis, flood-control works are inadequate or non-existent and sudden rainfall can be very destructive as well as implying a loss of usable water. Dams and channels of this type require more investment than the local community can muster unaided. A survey of the requirements for works of this type should establish the feasibility of partnership with the community.

Agricultural Extension

5.20 The Project should promote the expansion of the agricultural extension system to settlements inhabited by farmers. The main topics that require advice, awareness and access to inputs are;

a) Crop rotation
b) Risk aversion through crop diversification
c) Improved knowledge of animal health-care
d) Dangers of erosion from land-levelling
e) Honey production
f) Elimination of waste in irrigation systems

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ANNEX i. Terms of Reference

Family status and available resources

A detailed profile of the target group, in terms of family size, employment, available resources (labour, capital and land). assessment of the available resources and constraints

Quality of life

Access to physical and social infrastructure, water, health, schooling, roads, social security

Participation in decision making

Capacity of farmers to participate collectively or individually. In planning and implementation of projects/programs. Projects that concern them. Farmer views about existing co-operatives their role utility in helping them surmounting problems and overcoming constraints.

Financial and economic well being

Ascertain extent of poverty. Use indirect questions to estimate present farm and non farm income. Understand farmers' views of how to improve their income in sustainable manner.

Technology present and future.

Obtain a clear idea must with regard to the present practices in agriculture. and testing new ideas with them in terms of acceptability, adoption and requirements

Environmental concerns

Understand farmers' perception regarding resource degradation?
Formulate proposal to reverse the process? What are they willing to contribute? What do they expect from government to do?

Acceptability of project proposals.

What is the population feedback regarding the project approach, components and implementation arrangement?

Labour profile of the household

Analyse labour profile of the household to ascertain family labour availability, ensure participation in project implementation.

Person concerns

The survey should assess the present situation of women. Their labour profile, the constraints they face including access to land, credit and training. Women's expectations and activities they feel appropriate for their development.

Livestock

The survey should reveal means for promoting intensive livestock breeding, and integration of crop production and livestock.

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AGRICULTURAL RESOURCE MANAGEMENT PROJECT
SOCIO-ECONOMIC BASELINE SURVEY: KARAK AREA WADIS

ANNEX II. SURVEY METHODOLOGY AND ORGANISATION

The field survey was carried out between 10th and 28th June 1995. The questionnaires were designed in England and amended in the light of discussions in Amman. They were pretested in the field up to the 12th of June when a finalised version was prepared. The actual questionnaires are given at the end of this section.

Data was entered by Smart Systems, Amman, during the course of the survey and then checked by the survey personnel. The design of the front end was designed by the Mission Leader and programmed by Smart systems.

The personnel were;

Name	Position	Acronym
Roger Blench	Mission Leader	RMB
Mounia Hajje	WID Consultant	MH
Mohammed Qublan	Enumerator	MQ
Hulud Haimur	Enumerator	KH
Sana' Halasa	Enumerator	SH
Maha Salameh Arabiat	Enumerator	MSA
Isa Shobak	Enumerator	IS
Khalid Hwadi	Enumerator	KHH
Deema Jeries Qusus	Enumerator	DJQ
Fadi Suhel Al-Tal	Enumerator	FST
Fatima Abu Kaf	Enumerator	FAK
Dukhi Huneifi	Enumerator	DH

The acronyms were used on the original datasheets and in the database. Except for Roger Blench and Mounia Hajje, all the above-named are staff of the Ministry of Agriculture or the Queen Alia Fund, Amman.

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ANNEX V. SURVEY DATABASE

1. The data for this survey have been entered into the relational database, Microsoft Access 2.0 (Arabic Edition). They can be exported from this to all other major database formats. However, a front-end has been prepared to give users easy access to the data as well as the potential to explore relationships other than those reported in this document.