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MANAGING HERDS AND HOUSEHOLDS: MANAGEMENT PRACTICES AND LIVELIHOOD STRATEGIES OF SHEEP OWNING BEDOUIN HOUSEHOLDS IN THE NEGEV REGION OF ISRAEL

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ABSTRACT

Information collected on herding practices and economic activities of nine Bedouin households is used to define livelihood strategies and examine their economic viability.

Large variations found in herding practices and other means of subsistence are a response to external policies and constraints which limit herding space and sources of income. Differential access to resources and different socio-cultural norms are important factors.

The identification and analysis of different livelihood strategies is a useful point of departure for discussing the development of Bedouin herding in the Negev and for formulating policy that is more effective and empathetic.

PREFACE

A person visiting the Negev region of Israel today would most probably not associate its character - as far as sources of livelihood are concerned - with herding, pastoralism or other forms of "traditional" agricultural occupations in semi-arid zones. Nor will the visitor (in most seasons or locations) encounter many Bedouin roaming about in grazing sites. During recent decades the region has undergone a radical transformation in its demographic, occupational and physical structure. Once a typical "desert frontier" region with pastoralism and rain-fed agriculture as the main sources of livelihood for its inhabitants, who were predominantly Arab, the region is now populated mainly by Jews (The Gaza strip excluded) deriving their livelihood from various sources, agriculture (mostly intensive in practice) being only one of them. The Bedouin, who in the past have been the prominent group in the Negev are now considered marginal - both in numbers, control of resources and contribution to the economy of the region.

The process of sedentarization and "cessation of nomadism" (Shmueli, 1980) is not a unique development related to the establishment of the state of Israel. Similar processes, stimulated by the emergence of modern state structures (physical and administrative infrastructure, legal system, consolidation of power and control by the central governing body, etc.), have been witnessed all over the Middle East, from Saudi Arabia to Lebanon. In most of these countries an intentional effort was made to sedentarize the nomadic population, either in order to harness them to the general economy (e.g. Sudan; see Gurdon, 1985), to control possible opposition to the state (Saudi Arabia, Israel, and others; Ibid.), or combinations of these with other ethnic, political and economic considerations.

Clashes, conflicts and competition between the state and nomadic structures are by no means a new phenomenon in the region (nor unique to it); throughout history, the region has witnessed successive periods of strong central rule followed by weakening of these structures and consequent invasion and control of it by nomadic tribes. The present stage, however, seems to be of an irreversible character: never before has any governing body been able to control its populations as effectively as the present-day governments in the Middle East, nor have they been able to offer alternative sources of livelihood for these populations as are available today. As a result, the "nomadic reserves" of each country are dwindling fast and it is hard to conceive a scenario under which this state of things is to change much (Shmueli, 1980).

This state of affairs forms the basis of this study, which seeks to examine the economic viability of "traditional" Bedouin herders' livelihoods within a modern-developed economic structure. Such a discussion is of particular importance in relation to the state of Israel, where the conflict between "modern" and "traditional" systems is exacerbated, and complicated further by the unique social and political realities of this state.

The use of the terms "traditional" and "modern" in this paper is not meant to denote two separate realities; the "traditional" being a static set of practices and techniques passed unaltered from one generation to the other; and the "modern" being an ever innovative and changing set of practices. The term "traditional", should rather be taken as shorthand for the set of strategies which is practiced by the majority of Bedouin herd managers: strategies whose main characteristics (which set them apart from the "modern", mainly Jewish, herd growing sector) are the usage of relatively extensive production techniques (grazing, meat as the main product, and generally less capital-intensive rearing techniques); the use of a mainly household-based work-force (employed in the herd not only for economic, but also for social-cultural

reasons); the assumed importance of having herds which stretch beyond income-generation considerations (the herd as a socio-political-cultural source)[1]; and last, but not least, the spectrum of "traditional" practices of Bedouin are generally constrained by government regulations, which in more then one way determine the nature of herd-keeping and rearing.

Traditional practices are therefore never static, they adapt themselves to changing circumstances while taking into account a multitude of constraints and considerations relating to "having herds".

Thematic debates relating to the possibility of persistence vs. cessation of "traditional" livelihoods can be located in various disciplines and at different levels of analysis, although none of them are necessarily more appropriate or enlightening than the other - as any reality is a consequence of numerous forces and conflicting goals of actors and agencies. Nevertheless, obvious limitations necessitate a choice of focus for analysis. In this paper, I have chosen to examine the possibility of persistence - in terms of economic viability - of the household-based herd-keeping of the Negev Bedouin. I believe that the ability to analyse and understand existing practices is the cornerstone for the more general discussion on the future of such systems. By undertaking such an analysis, I hope to reduce the unfortunately all too common situation of "dialogue of the deaf" carried out between proponents of "persistence" and "cessation", both of whom all too often do not have sufficient understanding (and data) of the micro-level realities of these structures. The research methodology used here attempts to combine analysis of production, profitability and social aspects of the herd and household activities, all of which are of importance in understanding and defining what is being referred to as "livelihood strategies" of Bedouin herders.

The paper is limited in scope as it does not attempt to deal extensively with defining the Bedouin herding in relation to other pastoral systems; it does not attempt to discuss the future of the Bedouin society in Israel as whole; nor does it elaborate much on the theoretical approaches which could be used to analyse "traditional" systems. The main objective of the present undertaking is to devise a practical tool for analysing pastoral activities; one which would be able to incorporate certain elements of these systems which are not conventionally included in economic analysis.

The structure of the paper is as follows: in Chapter I, the research problems, questions and objectives will be outlined further; the rest of this chapter will offer an overview of the Negev region and its Bedouin population. In Chapter II the theoretical approaches adopted will be presented and discussed, as well as the methodological framework developed. This will be followed by an overview of the field survey (carried out in 1992-1993 on 9 Bedouin households) which was used as the main source of data for this paper. Chapter III is devoted to an overview and analysis of herd production over an annual cycle (herd dynamics, production results and profitability) and its relation to the livelihood and sustainability of the Bedouin households. In Chapter IV a summary and conclusions to the paper will be presented - in relation to (i) possible interventions and broader discussions on traditional livelihood systems; and (ii) the viability of the Bedouin herding practices within the present realities of Israel.

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[1] For an enlightening and thorough discussion on the meaning and value of having herds in pastoral societies (in Lesotho in this case), see Ferguson, 1990.

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I. INTRODUCTION

1. Research problems, questions and objectives

Within the relevant government agencies dealing with the Bedouin (The Prime Minister's Minority Office, the Ministry of Agriculture, and others) two main schools of thought exist with regard to the desirable future course of action in relation to the livestock-raising sector. On the one hand, there are those who hold the view that in the face of internal and external constraints and changes there is no place for the "traditional" Bedouin herding activity. Efforts to assist the sector, they claim, should therefore focus on making the transformation process from "traditional" to "modern" livelihoods as painless and smooth as possible. Resources should be used to improve the physical and institutional infrastructure in the Bedouin townships, and to improve the ability of economic (and possibly social) assimilation of the Bedouin into Israeli society. On the other hand, there are those who, while accepting the inevitable effects of development as far as the marginalization of the Bedouin herding sector is concerned, claim that: (i) the total decline of the herding sector would mean a dissipation of the Bedouin way of life, with the inevitable social and political costs; (ii) even within a developed economy and agriculture, activities such as Bedouin herding can be economically feasible, especially in semi-arid, arid and marginal lands (Noy-Meir and Seligman, 1979); (iii) following (i) and (ii), it is possible, and necessary to identify and help to improve those production techniques which are viable economically, and by doing so assisting the Bedouin to confront the changing reality of their physical and economic environment[1].

Although various aspects of the Israeli Bedouin traditions and way of life have been extensively examined, relatively few studies have analysed the economic and technical-ecological aspects and viability of their herding systems. This research focused either on macro-level socio-economic analysis of the Bedouin herding sector as a whole, issues of ecological sustainability and carrying capacity (Noy-Meir, 1975); or theoretical models of production (Noy-Meir and Seligman, 1979; Spharim and Seligman, 1988). Even fewer have attempted to examine the Bedouin household's economic activity and livelihood strategies (Abu-Rabia, 1991). Research carried out with regard to the sheep and goat raising practices in the Jewish sector (Vallk and Landau, 1985) are of only partial relevance to the Bedouin sector. This is because: (a) most of the techniques used by the Jewish farmers cannot be easily adopted by most of the Bedouin herd managers, either due to government regulations (which prevent the possibility of intensification by forbidding the construction of permanent sheds in areas not specified for settlement), lack of adequate financial means, know-how and official support (extension and finance), or unwillingness of some Bedouin to introduce such changes into their herd-keeping practices; (b) There is a fundamental difference between the place which the herding activity has in both sectors and the level of integration between the "enterprise" (the herd) and the "producer" (the Jewish farmer, the Bedouin household): for the Jewish farmer the herd is assumed to be mainly another agricultural enterprise - his management decisions result mainly from profit maximization considerations and are therefore susceptible to conventional profitability analysis; it is questionable whether such an analysis could be undertaken with regard to the Bedouin household-based enterprise, which is assumed to be making its production optimizing decisions on the basis of a much larger set of considerations - economic, social, genealogical, cultural, etc..

Research undertaken in the "Lahavim " farm, a demonstration farm set up in the Negev at the time of the Israeli withdrawal from Sinai with the intention of assisting the Bedouin society in confronting

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[1] These arguments reflect more general debates on the appropriate course for rural development, and in particular the debate on the peasantry as a persisting mode of production or as a transitory "precapitalist" structure (see Bernstein, 1990; Schejtman, 1992).

changing conditions of livestock raising (Ronen, 1989; Perevolotsky and Landau, 1988), and consequent proposals for improvement in breeding practices are also limited in their relevance to the Bedouin society as a whole - mainly because this structure (Fenced grazing lands) cannot be adopted at present by Bedouin herd-owning households.

This paper, based on field work carried out in a period of one year under the auspices of the A.R.O. (Agricultural Research Organization - The Volcani Center), attempts to add to the efforts of understanding the Bedouin herding practices by inspecting actual practices of Bedouin herd-owners and filling a presently existing knowledge gap with regard to the types of production and management practices and their economic viability; an undertaking partially intended to indicate possible improvements in those practices and to assist policy makers in formulating viable policies in regard to the Bedouin society. Although the future of Bedouin herding is closely related to political considerations, it is essential to acquire knowledge and understanding of this activity, which can form the point of departure for any discussion on possible interventions. Moreover, as I shall try to show here, establishing the degree of economic viability of the Bedouin herd-owning sector might shift the focus on policy interventions from a "welfare scheme" type of policy to a more genuine rural development intervention.

More generally, this paper attempts to examine methodological issues arising when an analysis of so-called "traditional" or "peasant" societies are concerned, with particular emphasis on the economic analysis of such structures.

These two related issues - filling the "knowledge gap" and devising appropriate analysis tools - are then the major problems addressed in this paper. Following these, a series of preliminary questions which evolve from the problems defined are:

1. How do the Bedouin manage their herds - what are the production techniques and management strategies used by Bedouin herd managers and what are the reasons for adopting them?
2. What is the most proper approach (and subsequent methods/techniques) to be adopted in analysing the herding activity - so as to capture assumed unique characteristics of the system while enabling some level comparison with "conventional" production systems?
3. Which of these practices are profitable and what are the reasons for it, and can they sustain a Bedouin household?
4. What are the main limiting factors faced by the Bedouin herding system?
5. Which possible policy interventions could be introduced so as to improve the viability of the herding sector?

In relation to these questions, the main objectives of this paper are thus:

1. Identification of main production parameters and definition of various management systems on the basis of observed patterns in the herds surveyed.

2. Devising an analytical framework for, and carrying out an economic analysis of the herding activity and of the household's expenditure and income patterns and sources.

3. Definition of general livelihood strategies - based on conclusions drawn from the analysis of the data collected.

4. Pointing to possible directions for improvement and assistance to Bedouin herd-owning households, based on research findings.

In short, the paper attempts to answer three main questions in regard to the Bedouin herding activity: why are they keeping herds? how are they managing them? and: is it profitable?

Each of the questions posed here offers a multitude of possible answers which could be examined. Reasons for keeping herds could be political, genealogical, desire for social control of household members, savings, a source of livelihood, or any combination of these. Similarly, the "profitability" of this activity, if one uses this term in the wider sense, so as to include notions of optimization of the social and cultural considerations, sustainability of the household etc., could be examined in light of these considerations as well. The present discussion will nevertheless be limited mainly to examining the economic viability of the herding activity, to analysing the production techniques and management styles of herd-managers (including an analysis of the herd's place within the general livelihood-generating activities of the household), and to inferring generalized types of livelihood strategies emerging from the analysis.

2. The Negev region - brief geographical and historical overview

Located in the south of Israel, the Negev (Hebrew: south land or dry-land) is bordered to the west by the Mediterranean sea, to the east by the desert of Judaea , to the North by the 400 mm. annual rainfall isoheight, and to the south by the Sinai desert (see map in the appendix). The annual rainfall varies between 100 mm in the southern parts to 400 mm in the north of the region, with a 30-40% coefficient of variation between the years (Noy-Meir and Seligman, 1979); the rainy season is in the winter (October-April) and is concentrated mainly in December-February. Annual temperatures vary between 0°C (and below) in the winter to 40°C (and above) in summer; the average for both seasons is, 5.4°C - 18.5°C in the winter and 15.8°C - 33.9°C in the summer (Marx, 1974). The region is characterized in geographical-climatic terms by the following trends: 'a decrease in rainfall from north-west to south-east, ... [and] a maritime effect in the west: higher air humidity and dew incidence, smaller diurnal and annual temperature amplitudes' (Noy-Meir and Seligman, 1979: 114). The field work on which this paper is based was confined geographically to the North-Western part of the region, which, at present, is the main area of grazing for the Negev Bedouin.

Herding has been practised in the Middle East for thousands of years, and evidence of such activity taking place in the Negev region of Israel dates back to the Neolithic period (Ibid.) .Owing to the climatic conditions in the region (especially in the northern parts), agricultural activities (mainly rain-fed agriculture) were also commonly practised throughout most of this period, and in periods of strong central rule in the region was the dominant activity in the less-arid parts of the region. As these two activities compete for the same resources, and were also practised traditionally by different groups (although there was never a clear cut division of vocations - farmers had herds and nomads practised farming to some degree), the region was always a frontier arena for the nomad-farmer conflicts, with the latter tending to get the upper hand in periods of strong central rule.

3. The Bedouin of the Negev - invasions, dominance and marginalization

From the beginnings of Arab rule of the region in the Seventh century, the nomads gradually came to control most of the region. This process was accelerated in the period of Ottoman rule (1517-1917) by several waves of invasion of nomadic Bedouin tribes from the Arabian peninsula, and the sedentary farmers were eventually pushed northwards beyond the 400 mm. isoheight and to the mountainous areas of the Judaean desert. The Bedouin who settled in the region relied mainly on herding, camel-transport and other traditional nomadic activities, although arid-zone agriculture was practiced as well. In the last two centuries before the fall of the Ottoman empire, agriculture was practiced mainly by farmers who came mostly from Egypt. They first settled in the coastal plains of the region (what is now the Gaza strip), and with growing

pressures there leased land from the Bedouin land owners. They gradually became part of the Bedouin society, but were never considered to be "true-noble" Bedouin (Marx, 1974).

The Ottomans confined their governance mainly to taxation, legislation of land ownership, and attempts to settle the Bedouin (mainly towards the end of their rule). These measures were all partially successful at best, and the Bedouin had, as a rule, a large degree of autonomy over their own affairs. A significant development which took place towards the end of Ottoman rule was the gradual development of motorized trade through the region which gradually deprived the Bedouin from one of their traditional sources of livelihood - transport of goods by camels (Noy-Meir and Seligman, 1979). The Bedouin expansion during the Ottoman rule was not confined to the Negev region only. Weak central rule enabled different tribes to move up north, and Bedouin tribes gained control over vast areas in other parts of Israel. The British (who ruled the region between 1917 and 1947) intervened even less. The Bedouin living in other parts of present day Israel were gradually marginalized (with the exception of Jerusalem and West bank areas), mainly due to a slow but steady expansion of Jewish settlements. During the Second World War, many Bedouin in the Negev found employment in the construction of bases and airports for the British army; this source of income was economically attractive to such a degree that many fields in the Negev remained uncultivated during those years (Marx, 1974).

This state of affairs changed after the independence war and the establishment of the state of Israel (1948). Many Bedouin fled the region (mainly to Jordan, Sinai and the Gaza strip) for fear of reprisals by the Israeli army. The Bedouin population within the borders of the new established state was significantly reduced (see table I.1); in many cases whole tribes left the region. Consequently, the number of tribes in the region was reduced from 95 to 19 (Ibid.). Large parts of the Negev were settled by Jewish farmers, who practice both intensive and rain-fed mechanized agriculture. The Bedouin population which remained was concentrated in - and until 1965 confined to - an area near the regional capital of Beer-Sheva, called the "Siag" (Hebrew, roughly meaning confinement) which was under martial law until the beginning of the 1960s (Marx, 1974).

Grazing outside the boundaries of the Siag was strictly confined and required the acquisition of grazing permits and an exit passes from the area. Most restrictions were gradually removed, and by the mid-1970s few of them were still in place.

Following the Israel-Egypt peace agreement, signed in 1978, which led to the withdrawal of Israel from the Sinai peninsula, the Israeli army relocated some of its bases in the Negev. Large areas, previously used mainly as grazing areas, were consequently sealed off for military purposes. This state of affairs was aggravated further by the establishment of "the black goat law" - which forbade grazing of goats outside the Siag area (Abu-Rabia, 1991). Following its establishment, many herd-owning households sold their goats and replaced them with sheep, mostly at a loss[2]. A further regulation introduced in the same period significantly limited the possibility of seasonal grazing in areas located to the north of the Negev region (Perevolotsky and Landau, 1988), although this situation has changed somewhat in recent years.

These changes in the external conditions faced by Bedouin herd-owners have accelerated patterns of change within the Bedouin society itself. The settlement of the Bedouin in semi-urban townships ("Bedouin

[2] In relation to this transformation in herd composition, it is interesting to note that such a process took place in other regions albeit for different reasons; as Dyson-Hudson and Dyson-Hudson note in relation to herds in Somalia: '...a 24 fold increase in exports [of livestock] between 1901 and 1975...[which was based on a] demand-boom in marketed livestock...[was created] by superimposing a modern marketing operation on a largely traditional pastoral production system... theses higher off-takes are achieved ...[among other things] by switching from camels and goats (safer subsistence animals) to sheep and cattle, which generally have a higher market value (1980: 41)

Towns") was accelerated and encouraged by the Israeli authorities, and about 45% of the Bedouin population are now living in them (Ben-David, 1988).

Table I.1 - Estimated Bedouin population in the Negev, 1914-1988 (in thousands)

1931	1949	1988	1991
48-67	16	70	80

(Sources: Marx, 1974, Ben-David, 1988,1993)

These changes, accompanied by an expansion in employment possibilities for the Bedouin (mainly in agriculture, commerce, and industries in the vicinity of Beer-Sheva), have led to a decline in the economic importance of herding among the Bedouin, as well as its prestige as an occupation - especially for the educated (Seligman & Noy-Meir, 1979; Shmueli, 1980)[3]. Today, about 35,000 Bedouin (c. 40% of the Bedouin population living in the Negev) still rely on livestock (generally sheep) as a source of livelihood. For 10,000 of these, pastoralism is of primary importance (Ben-David, 1988). In contrast to these trends the region has witnessed a substantial rise in the number of livestock at an average annual rate of 2%-4%, which could be attributed to a growing demand for meat in the local market; a tendency witnessed also in other countries in the region (Shmueli, 1980).

Table I.2. - Estimated size of Bedouin livestock, 1961-1988

1961	1974	1988
70	130	140-250[4]

(Sources: Marx, 1974, Noy-Meir, 1975, Ben-David, 1988, Abu-Rabia, 1991)

The effects of these changes are obviously not only economic-occupational, they also entail significant changes in the structure of Bedouin society. The sedentarization process, which started in earnest in the 1960s has brought about problems which, although well recorded in similar processes of sedentarization and urbanization, were mostly non-existent in Bedouin society. Lack of sufficient employment, whether in the townships or in the region, has been seen as one of the causes of the development of crime and to pronounced strengthening of Islamic movements within the towns - processes which in turn lead to further disintegration and conflict between various groups and tribes within Bedouin society, and between Bedouin society and the state of Israel (APS, 1990).

Some Bedouin, in particular those who are not yet settled in towns, feel that such form of settlement is an unacceptable alternative to their traditional way of living, and see the recent regulations as an intentional attempt to eliminate herding - and consequently the traditional way of life - altogether (Ibid.).Ben-David (1988) also claims that the township solution was taken mainly by farmer-Bedouin (i.e. *Falahein*, not of the "true-noble" Bedouin) and therefore does not present a general and feasible alternative for some of the Bedouin population. Factors which exacerbate the problem are a long-standing dispute

[3] The decline in importance and prestige of herding is not unique to Israel, and has been witnessed in other countries in the region, as noted by Gurdon (1985) who goes as far as stating that 'The point is well made that nomads despite the social and psychological advantages of the herding life, will always move to more comfortable and rewarding livelihoods when the opportunity arises' (p. 90).

[4] The large discrepancy stems from the difference between the lower estimation given in the official count and ones given by Abu Rabia and Ben-David.

between some of the Bedouin tribes and the Israeli government in relation to the nature of past ownership of land by the Bedouin - and possible compensations. In many cases, settlement in towns entails cessation of herd-keeping (as livestock are usually not allowed to be kept in most of these towns). Keeping herds is therefore also perceived by some Bedouin as one of the most effective means of sustaining their struggle. Moreover, some tribes (or rather groups within tribes) have appealed to the Israeli government to initiate a policy of agro-pastoral sedentarization, in the form of cooperative villages. By doing so they hope to secure rights to some resources (mainly water and land) which will enable them to maintain some of their traditional livelihoods. Some of the groups have actually managed (after long-term processes of appeals and demonstrations) to obtain permission to settle in such villages. This alternative form of settlement offers an interesting option for the future of Bedouin herding and in many ways revitalizes and enriches the discussion regarding present and future viability of Bedouin agriculture and herding.

II. THEORY AND METHODOLOGY

1. General framework of analysis - presentation and discussion

A prime objective in this research was to devise a framework which on the one hand will present results in a manner which will enable the comparison of the economic and physical production results with standard production performance and profitability analysis, and on the other hand enable the presentation of unique factors in the activity of Bedouin herders. The linkage created between the performance of the herd and the household's livelihood is of particular importance here, mainly in relation to the ability of this activity to support the household as a main source of income. Constructing such a framework requires initially the adaptation of a theoretical approach from which the actual analysis tools could be derived, and defining various factors which are to be used in it.

First, the unit of analysis has to be determined. In this paper the "herd-owning household" was chosen to be the basic unit.

This choice needs clarification in regards to the exact meaning of the definition: First, how is a household defined? Second - what does herd-owning mean and how is it related to the household? Third - how are decisions assumed to be taken within the household, by whom, and to whose benefit?

No generally accepted definition of the term "household" exists. Defining factors such as 'cooking units' (Hill, 1972: 58), 'living under the same roof', and 'sharing of the same abode or hearth' (Ellis, 1988: 13) are only a few of categorizations used in various works. In this paper the household was defined as "the group of persons who are sharing the profits from the herding activity". This choice was made in view of the central role of herds in the social and genealogical relations of Bedouin herd-owning households. While this might seem a straight-forward and reasonable definition, it creates (like any other definition chosen) anomalies such as individuals who are sharing the herding expenses but not the profits from the activity (e.g. mature sons employed in wage labor and assisting their parents), or ones which do not share (all or most) of their "external" incomes with other household members. This definition also presumes (at least implicitly) an equal degree of control of these sources by various household members.

The term "ownership" needs to be defined in relation to the Bedouin. Patterns of livestock ownership in pastoral societies are usually a complex and diverse construction of alliances, agreements, presents and obligations (Dahl & Hjort, 1976, Marx, 1974). Nevertheless, in all except one of the households surveyed, the male heads of the households, who are also the herd-managers, stated that the herds belong to them. It is obvious that this ownership is not entirely personal, and should be understood as household ownership entrusted to its patriarchal head. For all external dealings (purchase of food for the herd and other treatments, sales, licences, etc.) the herds were managed as one unit, rather than a grouping of smaller herds owned by different people[5].

A closely related issue is the nature of inter-household decision making processes: are decisions concerning the herding activity and the household taken only by one person (the head of the household) or is there a degree of cooperation, negotiation, and bargaining between different members? Although identifying these patterns in relation to the Bedouin household is most important, both in theoretical and in practical

[5] In the exceptional case of household no. 9, which also looks after his brothers' herds, the data collected is related only to that part of the herd which is owned by his household. No direct payment was made to the head of this household for tending his brothers' herds, and the benefits occurring to the household were in the form of cost-reduction (provision of transportation, cheaper inputs, etc.) and enhancement of internal and external connections of the household (see discussion on these terms in chapter II, section 2., and section 4).

(policy oriented) terms, in this paper the household is assumed to be managed by a "benevolent patriarch" - the head of the household. Such approaches have been criticized mainly because the household heads' optimizing goals might not necessarily reflect the maximum possible utility of various members of the household, women in particular (Ellis, 1988; Wolf, 1966). As a result, any analysis of household-based enterprises which does not examine issues of gender division of labour, the value of reproductive and/or unpaid labour, and the effects of patriarchal structures on the well-being of different members of the household is bound to overlook important (and usually unaccounted for) components of such structures. Consequently, any conclusions offered in regard to household economic activities and their contribution to the household members are probably partial and biased. Although these limitations are recognized, it was not possible to examine these issues here, as very little data relating to these issues was collected in the field survey.

We now have a definition of a household as a "patriarch-led, herd-owning and profit sharing" entity. In the rest of this paper the head of the household will be therefore referred to as "herd manager" (as opposed to herder, which could be another household member, or a hired shepherd); in the chapter relating to herd production and management we shall use the term "herd" (with the related numbers) to denote herds owned by each of the households; in most other cases, the analysis and comments will refer to the "households" as this term is defined here.

Second, the nature and goals of the herd manager - as the head of the household - have to be assumed, and a general approach to profitability analysis adopted accordingly. The approach adopted here views the herd-manager not as an individual profit maximizer but rather a benevolent head of a household. More specifically, it was assumed that *the herd-manager is not managing a herd, but rather a household which is relying on the herd as a source of livelihood (not necessarily the only one). His choices of management practices and livelihood strategies represent therefore an attempt to secure the household's existence.*

This assumption, which limits the usage of the terms "livelihood" and "management" - in that it uses them mainly in relation to physical production and profitability, is nevertheless seen as crucial to the definition of household livelihood strategies, and more important - to the analysis of their viability. Once the main objective turns from profit as the sole consideration to existence as the hallmark of the activity, the criterion for measurement of "viability" turns from discussion on margins of profits to that of ability to maintain a household which derives a significant portion of its economic sources from the herd.

What this definition, together with the other assumptions presented earlier, implies is that the herd-owner '...does not operate an enterprise in the [strict] economic sense; he runs a household, not a business concern' (Wolf, 1966: 2). Such a concept can be seen to be closely related to the "peasant economy", or the "Chayanovian" approach[6] which views the peasant unit as '...at the same time a unit of production and a unit of consumption where household activities are inseparable from production activity' (Schejtman, 1992: 279) which is '...engaged in the process of production with the aim of ensuring, from one cycle to another, the reproduction of their living and working conditions' (Ibid.: 278).

The term peasants can be generally defined in this context as rural people who live in "traditional" settings (in the economic sense) and are involved in family-based enterprises. In essence, this definition

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[6] The presentation of the concepts of "peasant economy" given here is partial, some of the factors regarded as crucial for analysing such structures in the Chayanovian theory - life cycle, farm (herd) size, and the notion of drudgery are either dealt partially with, only mentioned, or totally ignored. These omissions, however, are not seen to distort the concepts contained within the theory or to weaken the present analysis. For a fuller description of the "peasant economy" notion see Durrenberger (1984) and Schejtman (1992).

differentiates "peasants" from "farmers" mainly on the basis of the degree of relation and dependence on a capitalist economy. Particularly important in this context is the degree of commercialization of factors of production - mainly labor and land, which again is assumed to have a direct influence on the maximization process. Commercialization in this context should be taken to mean the ability to treat these factors as tradable commodities which could be bought and sold according to profitability considerations (Durrenberger, 1984).

The household is allocated with a set number of labourers - its members - who are also assumed to form a unified unit of production and consumption. The level of production of a peasant household is assumed to represent an equilibrium between the desire to secure an accepted standard of living on the one hand, and its degree of "toil-aversion", or drudgery on the other (Ellis, 1988). Profits are calculated without costs of labor: as labor is not fully commercialized in a peasant economy (due to physical, socio-cultural consideration, or lack of alternatives), no opportunity cost or alternative employment exist for persons employed in a peasant enterprise. The income of the household is also indivisible: it cannot be divided as returns to individual members-laborers, as the household is assumed to operate as a single entity.

Are these "qualifying conditions of originality" actually sufficient to grant the peasant economy a status of a distinctive mode of production? Many have argued that this is not the case. Critique from the neo-classical school of thought suggests that the so-called unique qualifications of the peasant household model are actually special cases of the general theory , and while they might very well require a special treatment within the general body of theory, they do not actually represent a wholly different rationale (De Janvry & Dethier, 1985).

It seems that the ability to attribute ,*ex-post*, the returns to factors of production, for example, on the basis of existing market value, or by imputing them on the basis of theoretical expectations does not necessarily invalidate the theory. The major importance of the peasant household economies concept is its ability to suggest a different maximization process (with its own well-defined rationale) to the neoclassical models; one which provides an alternative theoretical framework for conceptualizing and understanding such processes.

Another criticism of the definition of peasants as a unique mode of production, opposes both the notion of peasantry as a transitory mode of production within a Marxist-type evolution of economies, and also objects to 'romantic views of the ability of the rural "moral [peasant] economy" to resist commoditization' (Bernstein, 1990: 72). This approach suggests that 'The starting-point must be to view peasants today as agrarian petty commodity producers within capitalism...[who are] both capitalists and workers at the same time: they own or have access to means of production which they "put to work" with their own labor. As capitalists, they employ - and therefore exploit - themselves.' (Ibid.). Such views (regardless of the problem in the basic assumption that two critically opposing motivations could co-exist within the same unit) do not seem to actually challenge the notion that household-based enterprises operate according to a clearly defined and distinctly different rationale than capitalist enterprises, regardless of which definition of "mode of production" best describes them.

Third, following the decisions on the unit of analysis and the type of economic approach suitable for Bedouin society, a framework for linking the various assumptions, theoretical propositions, factors and data collected to a structure which enables the identification and classification of "livelihood strategies" needs to be developed. This requires defining what livelihood strategies are and what is their usefulness in analytical terms. Until now we have been discussing optimization processes of mainly an economic nature. The term "livelihood strategies" suggests that the optimization of household heads is not only confined to

economic maximization (whichever way incomes and profits are defined) but rather represents an optimization of a wider set of social, political and cultural factors of which the households' surrounding is made. The inputs might include such factors as social and cultural constraints, motivation, attitudes towards certain practices, etc. and the outputs are not only monetary - they can also be social, political and cultural. A choice of a livelihood strategy represents therefore an attempt to maximize the output of such a system as a whole. Optimization in this sense can also be taken to include "stability" "balance", "security" "social status", etc. as goals. The criterion for the economic viability of a peasant enterprise should not therefore be limited to measures of profitability, but should rather focus on "household sustainability" as the ultimate goal. Livelihood strategies are not necessarily static within a particular society or in time: decision-makers have the ability to construct, or choose, different combinations of practices to form livelihood strategies, a choice which depends on their personal resources and constraints, perceived goals and changing external conditions.

This approach can be seen to be closely related in theoretical terms to what Orlove (1980) terms "actor-based" models of decision making (e.g. Long, 1992).The usage of this concept in practical terms requires us to 'identify and characterize different actor strategies and rationales, the conditions under which they arise, their viability or effectiveness for solving specific problems, and their structural outcomes.' (Ibid.: 21).The operationalization of the livelihood strategies concept in this paper was attempted by combining analysed data on herd management practices and policies and production results, and economic performance, and the assumed rationale behind them. Data on each of these factors was aggregated, analysed and summary indices were constructed. These were used for identification of techniques and practices, which were the basis for the definition of generalized livelihood strategies. Various "actors" and "agencies" (ibid.) are identified, although the exact nature of their cross-linkages and effects on the Bedouin household were not analysed.

Another important limitation to the analysis of livelihood strategies in this paper is the relatively short period of time in which herds were observed. There is no obvious reason why herd managers should adopt a livelihood strategy based on annual maximization, and evidence from the research (reported and inferred) suggests that management practices (and livelihood strategies) might be adopted in relation to a longer time-frame. Therefore, the description given here is necessarily static, and where not, hypothetical in nature.

These limitations, which prevent the examination of the observed behaviour of the household within a wider context (both in time and as far as surrounding systems are concerned), common in other works carried out within the actor-based system of analysis, are strongly criticized by Marxist analysts, who regard precisely these elements (the surrounding political system in particular) as being essential to the understanding of the behaviour of the analysed units (Orlove, 1980: 252). As noted earlier (Chapter I, section 1), while I tend to agree that no general analysis of any socio-economic system can overlook those factors, one has to be careful not to commit the opposite fallacy, i.e. the tendency to view any system as solely a reflection or result of such forces and processes. Such an analysis might overlook both the strengths and weaknesses which exist within these systems and are not necessarily related to the general socio-economic conditions, and by doing so might fail to offer possible alternatives available within existing realities.

2. Pastoralism? Transhumance? Agro-pastoralism? Initial definition of the Bedouin herding practices within general concepts of herding systems

In early literature concerning the Bedouin, they were generally portrayed as noble nomads, whose main (if not only) source of livelihood - and pride - is herding and related activities (Marx, 1974). As was noted earlier, this was never an adequate description of the Bedouin way of life in the Negev (nor probably in other regions of the Middle East as well) . What then is an appropriate conceptualization of Bedouin herding practices and lifestyle? Pastoralism is not a uniform phenomenon; people adopt different patterns of livestock raising regarding movement, distance and duration while large differences occur even within tribes. Dyson-Hudson & Dyson-Hudson argue that 'Attempts to classify these patterns of livestock movements into categories such as "transhumance", "semi sedentary", "nomadic', etc. have proven to be an intellectually sterile enterprise'(1980: 18). While searching for exact definitions may be of little practical use, it seems to me that defining the type of livestock-keeping practices is a useful undertaking - in view of the need to eradicate false and romantic notions which affect our perception, interpretation and analysis of such systems.

What then are the factors which determine the definition of livestock-keeping practices? Factors which should be examined when a herding system is to be categorized include: (i) degree of dependence on livestock, (ii) degree of reliance on grazing as a food-source for animals, (iii) possible influence and adaptation to ecological conditions (climate, type of biomass and carrying capacity, seasons, etc.), (iii) type of, and changes in external political conditions which influence practices (iv) level of relation to a market economy (e.g. development and intensification of market infrastructure). (v) distance and duration of migration between and around locations, (vi) type of livestock kept - a factor determining the amount of labor needed, type and size of pasture, possible herd sizes (Dyson-Hudson & Dyson-Hudson (1980), De Carvalho (1974), Dahl & Hjort (1976), Sandford (1983) and Noy-Meir (1974)).

As can be seen, even from such a generalized and partial list, defining a particular herding practice entails essentially the placement of a specific pastoral group along a continuum which has nomadic-pastoralism at one end of the scale, and sedentary livestock-keeping farming at the other. Conceptualizing the latter category seems quite straightforward. Nomadic pastoralists are defined as 'people who are primarily dependent on livestock, who live in environments with marked seasonal variations, and who choose as their basic strategy for providing year-round food for their herds the movement of livestock to pasturage rather than bringing of fodder to herds'(Dyson-Hudson & Dyson-Hudson, 1980: 18).

Where should the Bedouin of the Negev be placed within this continuum?

Noy-Meir (1975) classified different management types among the Bedouin of the Negev, mainly according to distance and duration of seasonal migration and according to the degree of fodder and feed usage. According to his descriptions, as well as Marx's (1974) and others, the present Bedouin herding practices range between transhumance and home-range: most herds migrate seasonally (for different duration and distance), and spend a certain time of the year near a permanent dwelling (mostly in the winter). The degree of reliance on livestock as a source of livelihood varies between households. In any case, it is hard to conceive of a situation in which a disastrous year will result for the Bedouin in a situation of total loss of "entitlements" leading to mild or severe forms of deprivation, similar to such occurrences in other pastoral societies (Sen, 1981; Seaman, 1993). The degree of reliance on grazing as a food source and of ecological adaptation to the existing ecosystem of the Bedouin is also very different from that of other pastoral

societies (Dahl & Hjort, 1976). As both the degree of reliance and adaptation are more a result of external policies, these factors are not very useful in the definition of the Bedouin system.

The present herding practices of the Negev Bedouin could best be described as "pastoralism of the margins", and "marginal pastoralism". These terms denote two crucial aspects of current pastoral activity in the Northern Negev: pastoralism is permitted only on the margins of other agricultural activities, such as fallow and stubble fields and lands not suitable for intensive agriculture; it has also become a marginal occupation for the Bedouin society at large.

3. Field survey - overview of sample characteristics and data collection methods

Providing an answer to the questions and objectives presented in the first chapter required the acquisition of a wide variety of information, ranging from feeding and treatment practices, expenses and incomes of the herd and household, and "qualitative" information relating to past practices and general viewpoints on herding, future development, etc..

The data used in this paper was collected in a field survey conducted between September 1992 and June 1993 and relates to the period between June 1992 and May 1993.

(i) Scope and size

The survey covered nine Bedouin households. An attempt to collect data from a wider sample (given the time-limitations of data collation by one person) would most probably not have enabled the collection of various kinds of information needed for the analysis - as the ability to acquire sensitive information on production, expenses, and incomes of the herd and household depended greatly on establishing personal relations with household-heads. In addition, in view of the fact that no published data exists in relation to most of the activities which livelihood strategies were assumed to be constructed of, it was thought that spending as much time as possible with each household and collecting as much data as possible would be an appropriate starting point for such an investigation - in that it could point to relevant directions for further (and wider scale) investigation. The choice of collecting data on a monthly basis - rather than opting for a less time-consuming method such as an annual report given by the herd-manager at one point in time - was made in view of problems in recollection and accuracy which are bound to be more pronounced the longer the period of recollection is (White, 1984).

A stated objective in regard to data collection was an attempt to cover a wide-as-possible variety of practices and strategies. Parameters which were defined as meaningful in this context were:

a) *Tribal ascription* - the households belong to four different tribes. Tribal ascription is seen to influence the range of practices and techniques which the individual is exposed to or is willing to adopt .

b) *Annual grazing patterns and annual spring and summer grazing areas:* three different spring grazing sites and three different summer grazing sites were used by the households surveyed. Grazing sites differ in pasture quality, possible duration of seasonal grazing, and access to other resources (e.g. wage employment).

c) *Herd sizes:* household herd sizes varied between ones with up to 100 heads of sheep (2 units), ones with 100-300 (4 units), and households owning 300 or more (4 units).

Data was collected in a series of meetings with herd managers, carried out at their dwellings or at seasonal grazing sights. Each informant was visited at least once a month. For data collection pre-set questionnaires were used, as well as personal and group discussions (with family members, friends, other

herd managers, etc.). Most herd managers, and other informants spoke Hebrew, which was the language used in data collection.

(ii) Methods of information collection

In order to collect the multifarious data required, four types of questionnaires were used:

(a) *General questionnaire* - which was filled in once, at the beginning of the research. Data collected included (mainly): herd history (ownership, origin, etc.), inventory list and monetary assessment of family property and herd equipment, general management practices, problems and constraints related to herd management (personal description of herd managers), reasons for keeping the herd, definitions of optimal size and technical practices of sheep and goat husbandry - as defined by herd managers, and data on workers in the herd and the number of people whose livelihood depends on the herd.

(b) *Herd inventory form* - which listed the stocks of food and medicine, and numbers and kinds of sheep (rams, ewes, hoggets, lambs) and other animals at the beginning of the research.

(c) *Prices of sheep* - in filling in this questionnaire, each informant was asked to assess the market price of different kinds of sheep at the beginning and end of the research (i.e. in the space of a year), this data was used to assess the herd value in these points in time.

(d) *Monthly questionnaire* - this questionnaire formed the basis for the quantitative analysis. Data (relating to the beginning of each month) included: information on usage of inputs (with specification of quantities and destinations in the herd); "monthly production data" - information on sheep "entrances" (births and purchases) and "exits" (sales, presents, self consumption, mortality); expenses - purchases of various inputs and equipment; and data related to the family - various expenses and incomes occurring to the family from sources external to the herding activity (social welfare, assistance from relatives, wage labour, entrepreneurship, etc.).

In addition, general reflections on management, production, strategies, etc. provided by family members and friends were collected and recorded during various encounters.

The limited number of households surveyed poses an obvious limitation on the paper's ability to capture all (or even most) of the existing production techniques and management practices; the small sample also prevented the use of some analytical tools - e.g. regression analysis.

In the presentation and discussion of the results of the field survey, individual herds and grazing locations will be identified by numbers, tribes by letters, and locations by a general definition of an area (denoted also by letters).

III. SURVEY FINDINGS: PRESENTATION AND ANALYSIS

The description of the herding activity is based on the analysis of the herd production using conventional livestock-production analysis tools (herd dynamics, production rates, etc.). Various aspects of the herding activity are analysed and scored to form the basis for defining different management styles. Data on expenses and incomes in the herd and the household was obtained by using a "modified profit and loss statement" which is essentially a conventional accounting format amended so as to present unique features of the herding and household activities.

The rest of this chapter is structured as follows: in section 2 the herd production and management practices is presented and analysed. Section 3 presents the modified profit and loss statement, revenues, expenses and incomes related to the herding activity. Section 4 is dedicated to the presentation and analysis of other income-generating activities and overall economic performance of the households.

1. Overview

Table III.1 - general data of households surveyed

Household number	1	2	3	4	5	6	7	8	9
Tribe	Al A'zazmeh	Al A'zazmeh	Al A'zazmeh	Al A'zazmeh	Abu Qrinat	Abu Qrinat	Abu Qrinat	Al Qawai'n	Zeidneh
Permanent dwelling	I	I	I	I	VI	VI	VI	V	VI
Grazing site (spring, summer)	III, IV	III, III	III, VII	III, IV	VI,VI	II, VIII	III, IV	VIII, VIII	VIII, VII
Age of herd-manager (in 1992)	55	38	39	50	40	38	50	31	55
Beginning of management/ownership	1955	1991	1980's	1960s/ 1980s (1)	1984	1987	1960s	1970s	1990 (2)
Herd size	202	25	551	89	159	372	564	446	154
Household size	23	11	16	19	11	12	12	20	15
Use of hired labour (shepherd)	√	-	-	-	-	√	-	√	√

Notes:
(1) Received herd from father in 1960s, later sold the herd and worked as wage laborer in trucking and industry, returned to herding in the late 1980s.
(2) Herd given to four sons in the 1970s and managed jointly, divided in 1990 due to arguments on management and responsibilities, presently jointly manages his herd and those of two brothers. All the calculations given here relate only to his portion of livestock, expenses and revenues.

(a) Tribal ascription and management

Tribal ascription affects many aspects of life of Bedouin households - it influences the production practices adopted, the usage of labour, the ability to amass resources for investment, the degree of social importance attached to herding, and many related factors. The articulation of the specific social and cultural attitudes and practices of each tribe is beyond the scope of this paper and the description given here would concentrate mainly on those factors which are seen to relate directly to the herding activity.

Generally speaking, the Al A'zazmeh tribe is the "most traditional" among those surveyed. Located in the Southern parts of the Siag, its members are less involved in other occupations. Most family members have either basic or intermediary (high school) education at most and many women have never attended school. Members of this tribe have a strong sense of pride relating to their "Bedouinism" - which they relate to traditional semi-nomadism. Herding is often presented as a way of life rather than a source of livelihood. Members of the Abu Qrinat tribe, although in many ways in (at least verbal) agreement with the views of members of the Al A'zazmeh, are nevertheless involved in other occupations (mainly agriculture

and trucking). The level of education seems to be similar to those of the Al A'zazmeh, although in at least one of the household surveyed great importance was placed on education. All of the households surveyed in this tribe live in the northern part of the Siag, although most of the tribe lives in its Southern part[7]. Both tribes employ their women in the herding activity and rely on their household members (and sometimes relatives) as a source of labour. The Al Qawai'n and Zeidneh are closely related through intermarriages and geographical proximity (both live in the northern part of the Siag), both tribes are much more incorporated into the general economy than the other two. While they too are involved in agricultural contractorship, trucking, etc., they are also traders (mostly of agricultural products), construction, and similar occupation. They are renowned among the Bedouin as the most innovative and intensive sheep herders. The level of education seems to be generally higher, with many families investing considerable sums in supporting one, or more, family members in these endeavours.

Some warnings should be given in relation to the short description of tribes given here: first, it is based on a small sample of Bedouin (not only herd managers and their households) which I met during the survey. It is therefore possible that the description given does not necessarily represent existing realities. Second - as Marx (1974) notes, the Bedouin themselves tend to view their traditions and values more in terms of "desirable" then "actual", and only a long acquaintance and thorough analysis can establish the existing realities of the Bedouin. Third - in any case, there are probably more similarities then differences (naturally highlighted here) in the attitudes and practices of Bedouin herders, regardless of their tribal affiliation.

(b) Herd ownership and life cycles

The "herd histories", as reported by different households during the survey, seem to suggest a cyclical pattern, which in essence resembles the life-cycle pattern described by Chayanov in relation to the Russian peasantry (Chayanov, 1966): most herd managers started their working life as part - or full time workers in their parents' herd. In their early twenties (as a result of marriage, ageing of household head, or unusual circumstances), the herd was either divided between the children (a women usually getting 10 % of a man's share), or managed together by the household members. The herd usually grew with the years (presuming that herds were not sold, or hit by exceptional disasters) to their present sizes. Whether or not this cycle will continue into the future remains an open question - given both the changes in external conditions (government policies) and internal ones (diminishing prestige of herding, other possible sources of livelihood).

2. Herd production

The ability of the Bedouin to choose a bundle of techniques and practices which combine to form a "management style" is greatly limited by external regulations and constraints. Government regulations dictate the duration of grazing, pasture is chosen in many cases on the basis of availability rather then desirability, and in most dwelling areas (which are not officially recognized by the government as permanent locations for settlement) the construction of permanent structures (e.g. sheds) is forbidden. These limiting factors might lead to an assumption that herd management practices would tend to be similar in most herds. Despite the similarity in basic conditions under which households operate, a great variety was found in the way herd managers rear, feed, manage and sell their sheep.

[7] As far as I could find out, this fact is related to these households grazing their herds in this area during the 1970s and acquiring permission to settle temporarily at their present location.

(i) Annual and seasonal herd migrations

The period of grazing is dictated by administrative regulations, which are based mainly on three considerations: (a) Summer grazing is carried out mainly on rain-fed fields (Arabic: *Fallha*), which are usually prepared for sowing in October, thereby marking the end of the summer grazing season, (b) The beginning of the spring grazing season is determined by officials from the Ministry of Agriculture, and depends on observed biomass growth which can vary greatly from year to year due to annual climatic conditions, and (c) a fear that grazing in a particular location for an extended period might lead to establishing right-of-possession claims on them.

Annual herd-movements are divided into three periods:

Winter - mid/end of October until February-March. The herds are kept in the permanent dwelling area. Throughout this period the herd is sustained mainly on purchased feeds.

Spring - Spring grazing (Arabic: *Rabia*) is carried out from February-March to May-June. Acquisition of a grazing permit is conditional on (a) possession of a herd licence - which sets a limit to the number of sheep which a herd manager is legally allowed to keep, (b) the herd has to be vaccinated according to the veterinary board's regulations. These vaccinations are applied by a veterinary surgeon, and are given only up to the number of sheep specified in the herding licence[8], and (c) herd managers are required to submit a request for a particular site to the Grazing Department of the Ministry of Agriculture. There are three types of grazing sites available in this season: (a) army training zones: Fees charged for these sites are usually the lowest (excluding grazing in the area of the permanent dwelling and special deals), (b) sites belonging to the Jewish National Fund: with mainly wadis and woods in the region, (c) privately-owned sites: these are essentially fallow fields (mainly owned by *Kibbutzim* and *Moshavim* , two forms of agricultural cooperatives). Acquiring grazing contracts for such sites depends on personal connections of herd managers, and grazing a specific settlement's plots is usually reserved for particular households.

Summer - during the summer months (May-June to September-October) most herds graze on rain-fed stubble fields (mainly wheat and Barley) or fallow fields. The fields are leased for a per-dunam[9] fee from various land-owners (mainly *Kibbutzim* and *Moshavim*). Grazing in this period is conditional on acquiring a contract with a land owner and its approval by the Ministry of Agriculture. Pasture quality (and price) varies with the type of crop and height of stubble left after the harvest and straw-gathering. Acquiring grazing contracts for stubble fields in the northern Negev has become increasingly difficult in the last few years, as many farmers believe that herds act as weed-transferring vectors, and that the costs of weed-control in such a case are higher then the fees paid for grazing[10].

Grazing patterns in the two seasons are relatively stable, and most herd managers prefer not to alter them. Most herders migrate in relatively fixed groups of 2-3 households, made of clan members and/or friends. This enables mutual assistance and support, sharing of costs (fees, maintenance, purchases, etc.) especially when herd managers are absent, or in times of disputes[11]. This consideration is far from a minor

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[8] Many herd-owners have more sheep than fixed by the licence, so they either leave them in the permanent dwelling site, or put them up with herds of relatives or friends.

[9] Dunam = 1/10 of an acre.

[10] This claim is debatable. In discussions with some researchers at the ARO, it was suggested that, if anything, the sheep contribute to the eradication of "bad weeds" (sword-grass - *Phalaris* , Darnel, etc.). On the other hand, the agricultural extension workers in the region side with the farmers on this issue.

[11] A discussion regarding the social structure of Bedouin society is beyond the scope of this paper, it is nevertheless crucial to note that the Bedouins live in a society which is still strongly tribal. Disputes are rarely personal (although they can initially be so) but are taken up by the whole family, and sometimes tribe. Members of a family, clan, or tribe, enjoy the protection of the unit and are also held responsible for its acts. In cases of serious disputes, members of the same unit would prefer to stay together, so as to deter

one in deciding on particular grazing sites, as demonstrated by the fact that although some grazing land has been made available in the vicinity of area VIII, few herd managers graze there, despite heavy pressure on the "southern" parts during the same season[12].

(ii) Feeding practices

All herds were fed by purchased foodstuffs during the winter season. Most herds also receive supplements during other seasons as well.

Table III.2 - Feed supplements and average daily quantities

Household no.	1	2	3	4	5	6	7	8	9	Aver.
Feed supplements										
Jun.-92	-	-	*@	-	#	*@	#	#*@	#@*	
Jul.-92	-	-	*@	-	-	#@	#@	#@*	#@*	
Aug.-92	-	-	-	-	-	#*	#@	#@*	#@*	
Sept.-92	-	-	-	-	-	#	#@	#@*	#@*	
Oct.-92	-	+	#	-	#	#	+	#@*	#@*	
Nov.-92	+	+	#+	+	+	+	+	+	+	
Dec.-92	+	+	#+	+	#+	#+	+	+	+	
Jan.-93	+	+	#+	+	#+	#+	+	+	+	
Feb.-93	+	+	+	+	+	+	+	+	+	
Mar.-93	-	-	-	-	-	-	-	#	-	
Apr.-93	-	-	-	-	-	+	-	#*	#	
May-93	-	-	-	-	#	-	#	#*	+	
Average daily quantity per head (Kg.- winter)										
Cereals	0.2	0.4	0.5	0.3	0.5	0.5	0.2	0.5	1.5	0.5
Bran	0.8	0.6	0.5	0.65	0.2	0.25	0.2	-	-	0.46
Fodder (hay, wheat straw, etc.)	2.5	3	1	2.5	2.2	0.8	2	1	1	1.78

Code index: + feed supplements for all the herd (excluding lambs); * feed supplements for mothers # feed supplements for lambs; @ feed supplements for rams (during mating season); - No feed supplements.

The main types of feed used in different herds include cereals (wheat and barley), hay and straw, bran and purchased concentrates. Feeding types and practices are greatly affected by those common among family members or close friends[13].

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possible threats. In one of the households surveyed (no. 2) this consideration was stated to be as the main reason for choosing herding as a source of livelihood.

[12] Another commonly-cited reason for refusing to migrate to these areas was the presence there of bad weeds which are not found in the northern Negev (e.g. wild cauliflower, Hebrew. *Chalet*), and are harmful to sheep. Herd managers who do migrate there say that it is relatively easy to overcome this problem - by clearing the grazing land in advance (usually by manual application of herbicides).

[13] For example, participants from tribes A and B all reported the regular use of bran as a supplement to cereals, while members of tribes C and D totally rejected its usage, claiming that it has little, or no nutritional value.

Three types of feeding practices were defined:

"1" - Minimal -maintenance - feeding is carried out in winter time, and as a response to external constraints (unavailability or low quality of biomass at grazing sites). Herds: 1,2,4,5.

"2" - Medium - targeted, short term - feeding in winter, and additional supplements to selected parts of the herd (mainly lambs), for relatively short periods. Herds: 3,6,7.

"3" - High, targeted, long term consideration - Supplements or full feeding throughout the year, constant lamb feeding, selected feeding according to biological requirements (high pregnancy, lactating mothers, rams), and economic considerations (lamb weight in sale, weight addition to old ewes/rams before sale)[14]. Herds: 8,9.

(iii) Breeding

The peak mating season occurs in the months of June-July, as can also be seen by the distribution of lambing in Fig. III.1 (gestation period among Awassi sheep lasts about 150 days, see Epstein, 1985). Most herd managers do not apply any special treatments to the herd, apart from additional feed supplements to rams. None of the herd managers reported the usage of supplements to hoggets, separation of rams during certain periods[15] and other relatively simple techniques. The use of synchronizing hormones (which has a significant economic potential , as it enables achieving a second birth in a year, or three in two years, and also raises the occurrence of twins (Perevolotsky and Landau, 1988)), was not implemented by most herd managers as: (a) many of them believe that hormonal treatment weakens the ewes and shortens their productive life, (b) unsuccessful attempts to implement the technique of some Bedouin herders have led some to consider the method as too costly and risky, and (c) some herd managers believe that hormonal treatment equates to an interference in the will of god[16].

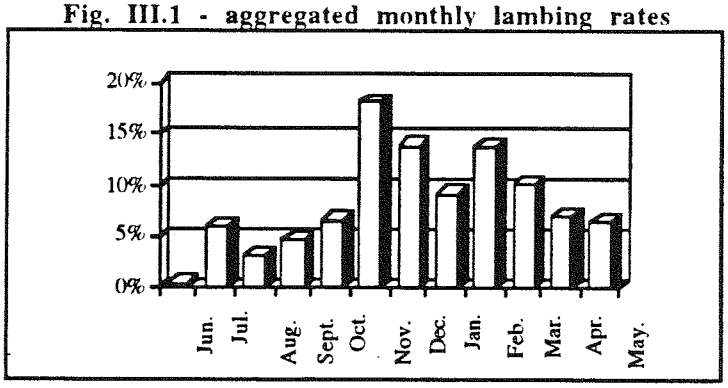
Three breeding practices were defined:

"1" - No treatment - Herds 1,2,4,5

"2" - Feed supplement application (rams and/or hoggets and ewes) - herds 3,6,7

"3" - Feed supplement application and hormonal synchronization - herds 8,9

Fig. III.1 - aggregated monthly lambing rates

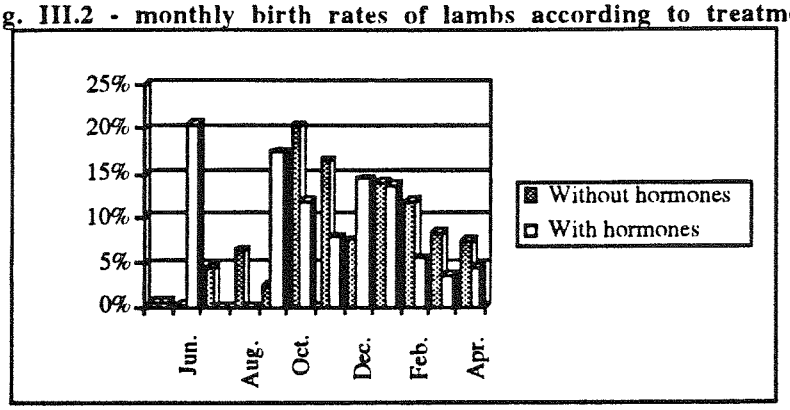


[14] These definitions are not categorical. In herds no. 6 and 7, feed supplements were given to lactating mothers in certain cases, although this didn't seem to add up to a long-term policy-oriented feeding technique.

[15] In order to achieve enhanced fertility of rams (Perevolotsky and Landau, 1988).

[16] As one herd-owner commented: "Allah will give me what he desires".

Fig. III.2 - monthly birth rates of lambs according to treatment



Note the difference in peak birth-periods. The summer birth in herds treated with hormones helps in reducing mortality among young lambs. Lambs born in the winter which are exposed to hard weather condition, due to the absence of appropriate sheds. This leads to higher mortality rates as a result of pneumonia, colds, and other related sicknesses.

(iv) Veterinary

Herd managers do not usually use the services of veterinary surgeons, apart from applications of vaccines (which is compulsory) and exceptional cases - such as the outbreak of a disease in the herd. Some herd managers monitor their herd regularly for minor sicknesses, and apply appropriate medications and vitamins.

Two levels of treatment are defined:

"1" - Application of vaccinations only , medical/vitamin treatment applied only in exceptional cases - herds: 1,2,4,7

"2" - Regular medical treatment (medications, vitamins) - herds: 3,5,6,8,9

(v) Herd labour force

Labour requirements vary between seasons, tribes/clans and families. In the winter, when the herd is kept at the permanent dwelling area, most household members participate in its maintenance, during different hours of the day[17]. The herd is fed 2-3 times a day, in the morning, noontime and sometimes in the evening. During the spring grazing period, the herd manager usually migrates with a small number of family members. As most of the children (at least the boys) attend school during that period. The mother (or one of the wives, in case there is more then one), along with elder household members remain with the children at the permanent dwelling site. Almost at all times one woman at least will be present at the grazing site. Her responsibilities include preparation of food, assistance in feeding (in case feeding supplements are provided), tending young lambs, milking (if that activity is undertaken), and herding (depending on tribal affiliation).

The composition of workers in the herd depends on: (a) family size and age composition - the number of children (mainly girls) of working age (about ten years old) and still present in the household (i.e. not married, working outside the herd, or studying), presence and availability of other household

[17] Schejtman regards this pattern of "labour investment" as one of the central features of the peasant economy: '...it makes use of labor power which would not be in a position to create value in other production contexts. We refer to the work of children, old people, and women and to the unsystematic use of the spare time of the head of the family and his adult children of working age.' (1992: 285-286).

members (wives, parents, etc.)[18], (b) customs and common practices - herd managers from the Al-A'zazmeh and Abu-Qrinat tribes use women and girls for herding, while those of Al-Qawai'n and Zeidneh reject this practice as being "shameful". Consequently, hired shepherds are employed in herds 8 and 9, although herd managers 1 and 6 (who belong to tribes A and B) hire shepherds as well, due to shortage in household members who are old enough to tend the herd.

Customs and practices also affect the milking activity. In Herds 1,2,3,4,5,6 and 7, no milking is undertaken for commercial purposes. Explanation for this range from tradition ("we are not farmers" - as one herd manager stated), to shortage of labor, lack of proper facilities, distance from markets and type of sheep (the Assaf breed having higher milk yield). Herd managers 8 and 9 usually milk for sale, although in herd 9 this was not done in the year surveyed due to lack of labour. Herd manager 8 sold his processed milk (mainly in the form of sheep-butter (Arabic: *Samne*) and hard cheese (Arabic: *Afig*) to Arab traders from the West Bank for 12000 NIS, which is equale to the sale price of about 30 lambs, a substantial addition to his household's income.

In none of the households surveyed were women employed outside the household or herd. Some household-heads specifically stated that one of the reasons for maintaining a herd was its role as a tool of social control over households members' behaviour - women in particular.

(vi) Lamb rearing practices and sales tactics

In most herds, lambs receive mother's milk freely during the first 3-4 months of their lives, after which they are either sold or weaned. In some of the herds, feed supplements (mainly milk powder) are provided to lambs during this period.

Three rearing and sales practices are defined :

"1" - sales according to age - herds 1,2,4,5. In these herds, lambs are kept up to the age of 3-4 months, after which they are sold regardless of market conditions at that period. These herd managers hold the view that keeping lambs beyond that period is not profitable, due to additional feeding costs involved.

"2" - sales according to prevailing market conditions - herds 3,6,7. The sales practices of these herd managers are similar to those of the previous group, although in some cases they might keep lambs for a longer period in anticipation of higher prices. This policy is nevertheless not adopted consistently, and varies greatly between seasons and years.

"3" - sales according to long-term projections - herds 8 and 9. These herd managers plan the breeding (and birth) intervals according to assumed market conditions. They also tend to keep the lambs for a longer period - up to 5-6 months.

Exceptional Sales: in the case of a need for large amounts of cash (weddings, purchase of car, assistance to family, etc.) large-scale sales, usually including ewes as well, are carried out. During the year of survey households 4,6 and 7 carried out such sales.

[18] These considerations resemble the Chayanovian notion of "life cycle" as a determinant factor in labor availability, and consequently farm-size (Chayanov, 1966). Examining the direct relationship between household composition, herd-size, and profitability is undoubtedly extremely important in relation to the issues dealt with in this paper, but unfortunately a detailed analysis - requiring examination of labor time-allocation (Minge-Kalman, 1976; White, 1984), definitions of responsibilities, etc. - was not undertaken in the field work.

(vii) Production

A thorough analysis of the technical aspects of herd production is beyond the scope of this paper. Table III.3 summarizes the main factors.

Table III.3 - Production data

Household number	1	2	3	4	5	6	7	8	9	averages
Average herd size (excluding lambs) (1)	202	25	551	89	159	372	564	446	154	285
Mothers (Ewes, excluding hoggets) (2)	198	24	484	76	143	277	494	336	129	240
Total births	238	27	519	67	119	239	360	524	105	244
births per mother (lambing rate) (3)	1.20	1.11	1.07	0.88	0.83	0.86	0.73	1.56 (4)	0.81	1
lamb mortality (5)	76% (6)	7.4%	11.4%	3%	7.6%	13.4%	9.7%	14.1%	2.9%	16.2%
sheep mortality (7)	14.3% (6)	3.9%	20.5%(6)	1.1%	1.9%	3.8%	8.1%	6.3%	9.7%	7.7%
% lambs sold during the year	55%	44%	38%	35%	46%	44%	70%	58%	32%	46.8%
% sheep sold during the year	6%	-	0.4%	-	-	16%	5%	9%	9%	5.04%
Annual change in herd size	-24%	-4%	-14%	-1%	-2%	-20%	-13%	-17%	-19%	-12.7%
Annual change in number of mothers (8)	-24%	-4%	-20%	-1%	-2%	-18%	-12%	-15%	-13%	-12.1%
Type of sheep (9)	Awassi	Awassi	Awassi	Awassi	Awassi,	Awassi, Assaf	Awassi	Awassi, Assaf	Awassi, Assaf, Merino	

Notes:

(1) Average herd size = Σ(Ei+Hi+Ri)/12; Where i=1...12 (monthly count), Ei = number of Ewes in the beginning of month i, Hi = number of hoggets in the beginning of month i, Ri = number of rams in the beginning of month i.

(2) It was assumed that only ewes gave birth during the year surveyed.

(3) Lambing rate, also termed "productivity" (Perevolotsky & Landau, 1988). was calculated as: number of lambs born /Average size of mother-herd. The average calculated birth rate coincides roughly with reported rates in similar herds: Somalia - 0.6-0.9, Iran - 0.8, Sudan - 1.5 (Dahl & Hjort, 1976: 91), "Lahavim" - 1.1 (Perevolotsky & Landau, 1988: 55). Lambing rate, the way it was calculated here, can be skewed if significant changes in size of the mother herd have occurred during the year, as in the case of herds 1 and 3 (see note 6).

(4) Note the large differences in lambing rates, which might be attributed to successful implementation of hormonal synchronization, feeding practices, type of sheep, or a combination of these factors.

(5) Lamb mortality rate = total number of lambs which died, from the day of birth until selling or transfer to mature herd (end of the year)/ number of lambs born. The main reported causes for lamb mortality were: (a) diarrhea - which is the result of over suckling of mother's milk, especially in warm weather, and (b) insufficient facilities for maintenance of suckling lambs. Many lambs are reported to have died during the winter season as the result of colds and pneumonia. The average mortality rate is lower than that given by Dahl & Hjort for Sudan and Zimbabwe, which is 30.5% and 17.9% (for the first four months of life) respectively (1976: 95), but higher than that reported by Perevolotsky & Landau for the "Lahavim" farm: 7.33%, although they also note that these rates are better then the ones reported for similar herds in the region (1988, 55-58).

(6) This extreme mortality was the result of cattle plague.

(7) Sheep mortality rate = number of mature sheep which died from old age, perdition, or sickness/average herd size. The causes of death are usually various viral diseases, swelling (as a result of overeating of cereals), and udder (nipple) diseases. Two diseases have had a pronounced effect on the herds observed: (a) Cattle plague - this disease was brought by herds which grazed in areas VII and VII, and (b) Brucelosis ("The Malta fever") - this disease, which is also potentially harmful to humans, has affected mostly herds grazing and located in "northern" areas, i.e. the dwelling and grazing of tribes B, C, and D. Herd no. 8 was affected by it and in accordance with veterinarian chamber's regulations, infected sheep were killed and compensation paid to the herd manager.

(8) The fact that a tendency of decrease in herd size was observed in all the herds surveyed might be explained by calculation methods (lambs remaining at the end of the year were not added to the mature herd-count at the end of the year). In any case, no herd manager reported such an intended policy on his behalf, or as a result of official policy.

(9) Awassi - the indigenous sheep, Assaf - a cross between Awassi and East-Friesian sheep, which has higher milk yields but is less suitable for extensive grazing.

3. Profitability analysis of the annual production in surveyed herds

The basic tool used for the profitability analysis was a "modified profit and loss statement": a form based on standard accounting sheets, (Goldshmidt, 1992), adjusted according to the nature of the Bedouin herd (Ronen, 1989). A section which calculates household expenses and returns was also added to the sheet, and this part of the statement is discussed in section 4 of this chapter. Before proceeding to discuss the various results, the profit and loss statement sheet is presented.

(i) Profit and loss statement - presentation and discussion of the financial analysis framework

A profit and loss statement is one component of an annual financial analysis, which is usually adjoined to a balance sheet. The first is used in order to aggregate and analyse the various cash flows within the enterprise, and the other measures the changes in assets. If one compares an enterprise to water storage, then the profit and loss statement is similar to the measurement of the flows from the feeding source to the storage during a period (in most cases a year), and the balance measures the level of water at a given point in time. Using this analogy it is clear why balance sheets were not prepared for each herd: establishing any conclusions using this tool requires a comparison between years, which was not possible due the time-limit of the field survey. The same reasoning holds for not using other financial analysis tools such as cash flow and cost-benefit analysis, which might have been more enlightening in the context of an economic analysis.

Profit and Loss statement			Herd No. 1
	NIS (1)	NIS	NIS
Net Sales	38500		
Production, operating & inventory costs (list A)	92696		
Herd income		-54196	
Household expenses (list B)	32030		
Financing ("interest") expenses (2)	3738		
incomes from other Sources (list C)	0		
Net household income		-89964	

List A - Production costs			
	NIS	NIS	NIS
Herd feed consumption (3)			
Beginning inventory	0		
+ purchases	26400		
-Closing inventory	783		
Total food consumption		25618	
Grazing fees			
Winter and spring	910		
Summer	6320		
Total grazing fees		7230	
Veterinary (list D)		2350	
Wage labour (4)		15000	
Operating costs (5)			
Tractor	2770		
Car	0		
Machine repairs	1700		
Water	2820		
herd equipment (tools)	0		
Insurance (herd & machinery)	150		
Taxes & fines	0		
Total operating costs		7440	
Total production & operating costs			57638
Changes in livestock inventory (6)			
Decrease (increase) in herd value	13107		
Decrease (increase) in lamb value	21951		
Total change in livestock Inventory			35059
Total production costs			92696

List B - Household expenses		
	NIS	NIS
General Expenses (food, clothing,etc.)	26500	
Social services (social security, medical insurance)	0	
Special expenses (wedding, party, etc.)	5530	
Other	0	
Total Household expenses		32030

List C -Incomes from other sources		
	NIS	NIS
Wage labor	0	
Entrepreneurship	0	
Transfers from family members	0	
Social security (allowances)	0	
Other	0	
Total incomes from other sources		0

List D - Veterinary		
	NIS	NIS
Treatments applied to the whole herd	2350	
Treatment applied to Mothers	0	
Hormonal treatment	0	
Other	0	
Total veterinary		2350

a) Notes on calculation methods and conventions used in various items of the statement

(1) Two general assumptions were made in dealing with flows contained in the statement: (a) herd managers use three different currencies in their financial dealings: NIS (New Israeli Shekel), Jordanian Dinar and US dollar. All transactions taking place in other currencies than NIS were converted according to the following rates: 1 Jordanian Dinar = 4 NIS, $1 US = 2.75 NIS, and (b) it was assumed that all financial transactions were carried out at the time of transfer of goods, although in some cases payments and receipts were spread throughout the year, or even beyond.

(2) Financing ("interest") expenses - each herd-owning household maintains an extensive network of sheep (mainly lambs) exchanges with relatives and friends. Exchange here means either the actual giving of a lamb/sheep, or its slaughter in honor of a guest. Such exchanges were assumed to represent a form of "social interest payment": the household revitalizes its ties with individuals and households through this network of reciprocal gift-giving and taking (Marx: 1974). Although such exchanges cannot be seen as a direct "risk premium" (as herd managers might turn to those relatives/friends in times of need for large sums and not only in time of trouble) they do seem to fortify existing commitments for mutual assistance in case of need. As such, one can argue that these reciprocal exchanges represent (at least partially) the "interest" paid on capital invested (or to be invested) in the herd, or the "maintenance costs" of such relations[19]. This justifies the calculation of these expenses in the herding profitability analysis[20]. On the other hand, sheep slaughtered for self-consumption, were not included explicitly in the calculation of expenses, although the reduction in sheep (or lambs) numbers was calculated as inventory decrease and reduced the production profit (see section on inventory).

Financing expenses (FE) were calculated as: FE = QS*PA

Where: QS = number of lambs (sheep) slaughtered or given as presents.

PA = average sale price of lambs (sheep), calculated for each herd manager.

(3) Herd feed consumption - the value of beginning inventory was charged according to values reported by herd managers. Feeds bought during the year were valued at actual purchase cost. Closing inventory was calculated as: $\Sigma Qi*APi$

Where: Qi = quantity of feed i remaining at the end of the year.

APi = average purchasing price of feed i (in case it was purchased more than once during the year).

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[19] '...investments in "social capital" may be necessary not only to reduce risk but to assure access to resources over the long run' (Barlett, 1980: 557).

[20] The attachment of economic values to reciprocal exchanges and social transactions, was criticized by anthropologists and economists, who argue that such exchanges 'bear only a superficial resemblance to market transactions' (Ben-Porath, quoted by Netting, 1993: 298)

Consumption was calculated according to reported monthly quantities given to the herd in question. In case the reported consumption added up to more than the initial inventory, the herd was charged for the excess amount.

(4) Wage labour - wages paid to hired shepherds.

(5) Operating costs - Some of the operating costs charged to the herd in this section of the statement ("car" being the most obvious component), should have been shared by the household, rather than attributed to the production activity alone. Nevertheless, no method of dividing these costs (e.g. charging methods used in absorption cost calculation (Goldshmidt, 1992: 137-150)) was used. Consequently, the herd profit calculations might be negatively skewed.

(6) Changes in livestock inventory - following Hicks' maxim that 'profit is the maximum sum a person is entitled to consume during a period, so that his capital at the end of it will be match his initial capital stock' (quoted by Goldshmidt, 1992) and on cost-accounting conventions (Ibid.), the value of livestock inventory at the beginning and end of the year was calculated, and the difference between the two periods was defined as increase (decrease) in herd value.

The calculation formulas devised were:

increase (decrease) in herd size = $\Sigma(Qi1*PAi1) - \Sigma(Qi2*PAi2)$

Where: Qi1, (i=E,R,H) = quantities of ewes (E), rams (R) and hoggets (H), in June 1992

Qi2, (i=E,R,H) = quantities of ewes (E), rams (R) and hoggets (H), in June 1993

PAi1, (i=E,R,H) = average prices of ewes (E), rams (R) and hoggets (H), in June 1992

PAi2, (i=E,R,H) = average prices of ewes (E), rams (R) and hoggets (H), in June 1993

Average prices = each herd manager was requested to report prices of animals in June 1992 and 1993. These prices were then averaged and were taken to represent the price of a particular kind of sheep at those periods.

A negative result in the equation represents an increase in the value of livestock inventory, and therefore lowers the production costs (and increases profits).

the increase (decrease) in lamb value was calculated using a similar method.

b) Items omitted from the modified profit and loss statement

Depreciation - an accounting convention, depreciation is meant to denote the wear and tear of equipment used for the production process. There are different ways in which this depreciation could be calculated, and the choice of a particular system depends on the nature of the enterprise, the nature of equipment used, etc. (Ibid.). Some of the accounting conventions used for intensive agriculture could not be adopted, as in many cases the Bedouin use equipment whose usage period has gone much beyond the usage period defined for depreciation, and therefor could only be valued at "salvage value". In other cases, equipment used by herd managers was built out of old parts of machinery, and no uniform method of depreciation could be determined (or for that matter, be of much use). The inability to compute accurately the depreciation of production assets should nevertheless not be regarded as greatly affecting the profit calculations, as most of the "capital" used in the production process is livestock, the depreciation of which is implicitly accounted for by adult mortality and by changes in herd value.

Interest charges and other financing costs - no other interest charges were made for the households apart from the "social interest" mentioned earlier. None of the herd managers surveyed in this research has

used bank loans as a means of financing the herding activity, or other purchases. Consequently, the main source for loans are non-household family members and friends. The herd managers insisted that no explicit or implicit methods of interest payment (e.g. initial lump-sum payment) are used when such loans (usually given for a period of up to a year, but sometimes longer) are taken. Although in theoretical terms no system exists in which interest rate is not used in one form or another[21], this issue was one of the most sensitive among the surveyed herd managers, and the information collected in relation to it was deemed insufficient for analysing this aspect of the household activity.

Household labour costs - the reasons for not calculating household labor costs for the herding activity were argued earlier in this paper (see Chapter II, section 1). In addition to the theoretical justification provided earlier, imputing wages *post factum* was also regarded as incapable of being meaningful, either for equating the Bedouin herd to other similar enterprises, or as a part of the internal profitability analysis. Each of the methods which could have been used to impute wages in the absence of direct payments would lead us to conclude that the actual wages paid to labour employed in managing the herd is zero, or close to zero.

Such possible methods include: (a) The opportunity cost approach - according to this method, the wages paid to workers in the herd should be equal to the wage which an individual could have obtained had he/she been employed in another enterprise. Most of the workers in the herd (herd managers and hired shepherds excluded) are women, old people and children. Women who work with the herd could not leave the household, due to reproductive duties (tending to old parents and young children) or to traditional constraints (sending women to work out on their own is considered shameful by most of the Bedouin). Children which are employed in the herd, as well as elderly people, most probably would not be able to find optional employment outside the family herd (or in the case of Bedouin children in the households surveyed, would not be permitted to do so); (b) The wage equals living expenses approach - a method, which was used in cooperatives in Israel, assesses wages by calculating average per-capita expenses. Attempting to apply this approach here would also lead to calculation of wages which are extremely low by Israeli standards; (c) the Marginal Value of Product (MVP) approach - according to this approach, the return for a person's labour is equal to his/her addition to the value of production of the enterprise. Assuming that labour is allocated by the enterprise according to efficiency considerations. As mentioned earlier, the Bedouin household-head (as other household based, "peasant" systems) does not employ his household members according to profit maximization considerations but, as some argue, according to labour-force availability or genealogical obligations (Schejtman, 1992). Attributing such rationales to the herding activities would most probably lead to similar "illogical" results as those imputed by the other methods.

[21] Interest represents the time-preferences of individuals giving and taking loans. The former is being compensated for his willingness to postpone present usage of the money, while the latter is assumes that his future benefits from the loan taken justifies taking it with the required compensation. Another way of looking at interest payment is to regard it as payment for forgone opportunities: as herd-owners do not usually keep large sums of cash, giving a loan forces them to sell some of the herd, with the consequential reduction in production. Conventional rationales would suggest that some compensation should be paid for these losses, unless (as some theoretical juggling might suggest) this imputed interest is equal exactly to the risk premium which the loan-giving individual is willing to pay for the security of belonging to a particular affiliation - household, clan, etc.

(ii) Herd incomes and possible influencing factors

Table III.4 - Production results: herd incomes, expenses and profits

Household no.	1	2	3	4	5	6	7	8	9	Ave.
Herd income	-54196	-6806	75863	3806	29518	10902	33556	118975	-21061	21173
Production costs: relative expenses on components										
feed (%)	44	26	51	48	61	41	50	56	41	47
grazing (%)	13	10	17	7	15	7	25	5	6	12
wage labour (%)	26	0	0	0	0	13	0	8	7	6
Operating costs (%)	13	62	26	43	15	37	22	27	36	31
veterinary %)	4	2	6	3	8	2	2	5	9	5
Incomes and expenses in relation to the herd										
Incomes from lamb sales	32500	4560	86550	9200	21200	37520	80800	152060	19440	49314
Average price per lamb (1)	250	380	437	383	385	351	319	505	463	386
returns per mother (2)	164	187	179	121	148	135	163	452	150	189
Average expenses per mother (3)	468	473	24	70	58	150	109	159	352	207
Total Prod. & operating costs per mother (4)	291	620	220	338	141	258	177	327	497	319
Total expense on feed per head (3)	127	156	98	137	78	79	78	138	172	118
aver. profit per mother	-273	-283	156	50	206	39	67	354	-163	17

Notes:
(1) Average price per lamb = average reported sale price of each household.
(2) Returns per mother = total returns from lamb sales/average size of mother herd
(3) Including inventory changes, see sample sheet.
(4) Without changes in inventory.

The only knowledge-transformation channels existing for the households surveyed were family members and friends. Most herd managers had very little contact with the extension officer assigned to the Bedouin herding sector by the Ministry of Agriculture. In the absence of any effective extension and financial assistance services, the adoption of new techniques becomes an even more risky undertaking than it is by nature. While adopting advanced production techniques has a larger profit potential, it also increases the possibility and magnitude of losses.

No clear linear correlation was found between size of owned herd, expenses, and incomes (see Fig. III.3 and III.4), as might have been expected following the theoretical notion of economies of scale and the herd managers' own views on the issue. However, it seems plausible to suggest that herd-size does have an effect on relative expenses and profitability, as all of the losing herds are ones with less than 250 mothers (see Fig. III.4).

Fig. III.3 - average expenses per mother in relation to herd size

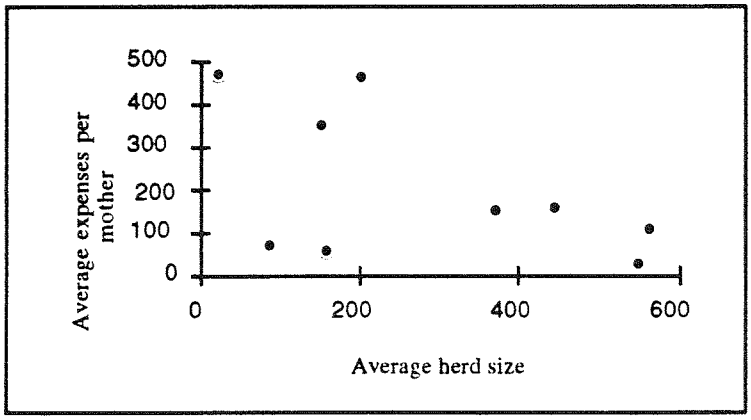
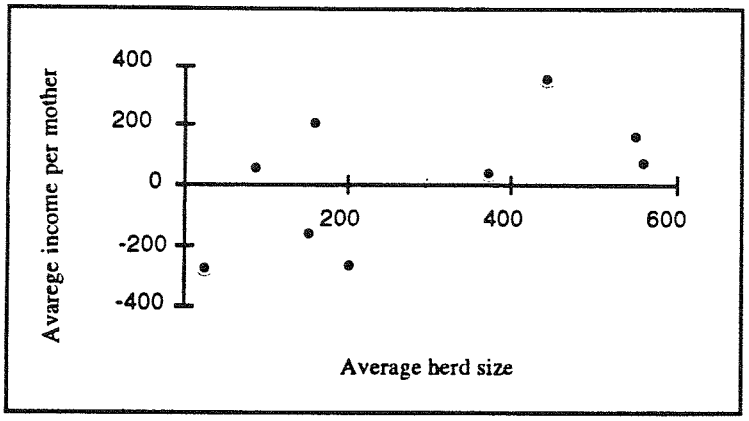


Fig. III.4 - average income per mother in relation to herd size



The Bedouin purchase most of the inputs for the herd from Arab traders (mainly from the West Bank and the Gaza Strip). Most Bedouin herd managers are not members of any marketing cooperative. Large processing mills and factories, as well as farmers usually do not engage in small-scale sales, and prefer to sell their products to large traders or through marketing cooperatives. The obvious result of this situation is a mark-up of input prices by traders dealing with Bedouin herds. An example of such a mark-up is bran: up to only a few years ago considered as waste sub-product of the wheat/barley sifting process, its reported average purchase price among herd managers was almost twice its official price (see table III.5). As food purchases comprise on average 46% of total production and operating costs, the effect of these limitations is self-evident. However, it should be noted that in many cases the traders are used as sources of capital - either in the form of extended credit (sometimes up to a year) or direct loans.

Marketing of sheep and lamb also plays an important role in production profitability. Although the main market is located in Beer-Sheva, almost all herd managers sell some of their sheep and lambs directly to traders at the grazing site or in the permanent dwelling area. The ability to get better prices than market averages depends largely on rearing and sale policies (as presented earlier), and personal abilities. Some herd managers also sold some of their livestock in smaller markets (at Rahat - the largest Bedouin settlement and in West-Bank cities).

Table III.5 - input prices (per 1000 kg., unless stated otherwise)

Household number	1	2	3	4	5	6	7	8	9	Ave.	Market prices
Wheat	500	-	263	-	433	400	358	330	229	359	353 (1)
Barley	-	650	-	400	-	-	350	400	-	450	330 (2)
Maize	-	-	-	-	600	500	-	500	-	533	380 (1)
Feed	-	-	660	540	-	700	680	740	630	658	
Hay	-	-	210	-	-	242	-	250	215	229	120-180 (3)
Hay (peanuts)	270	240	275	308	-	-	280	-	-	275	
Hay (maize)	-	-	-	-	244	-	245	-	-	245	
Straw	-	-	100	-	75	-	-	-	115	97	50 (4)
Bran	450	530	450	400	425	400	410	-	-	438	
Ave. price (Dunam-spring)	-	0.83	3.00	-	-	-	2.40	5.00	5.50	3	
Ave. price (Dunam -summer)	2.44	9.22	4.10	-	5.00	6.00	2.42	-	4.13	5	

Notes:
(1) Market prices, July 1992 (source: Katsin et al., 1992).
(2) CIF price - July 1992 (source: Ibid.).
(3) Price range of hay in storage (source: Ibid.).
(4) Price in storage, 1992 (source: Ibid.).

Personal connections within the Bedouin society, and more importantly outside of it, are one of the most important inputs to the herd production activity. Personal connections enable choices of preferred grazing sites, acquiring lower prices for inputs and livestock, extending grazing periods, etc.[22]. It is hard to quantify the value of connection networks, but the time and effort spent on cultivating them by different herd managers, and their effect on acquisition of grazing sites, can be taken as supportive evidence of their significance[23].

4. Classification of management styles

The indices used for classifying different aspects of the production activities were aggregated to a single index of "management styles". This index is assumed to be a representation of the general approaches of each herd manager to herd-keeping - from breeding to selling of lambs.

Table III.6 -Aggregated management indices

Household number	1	2	3	4	5	6	7	8	9
Feeding	1	1	2	1	1	2	2	3	3
Breeding	1	1	2	1	1	2	2	3	3
Veterinary	1	1	2	1	2	2	1	2	2
Sales	1	1	2	1	1	2	2	3	3
Sum of indices	4	4	8	4	5	8	7	11	11

Four styles were defined in accordance with the aggregated scores of each household:

"1": traditional minimizer - "an eye on the herd and a hand on the purse strings" (sum of scores: 4. households 1,2,4)

"2": Maximizing traditional (sum of scores: 5-7. Households 5,7)

"3" Transitional (sum of scores 8-10. Households: 3,6)

"4": Maximizing/innovator -"a hand on the herd and an eye on the market" (sum of indices: above 10. Households 8,9.)

The "traditional minimzer" is closest to traditional Bedouin pastoralism (Epstein, 1985). The "maximizing traditional" differs from the first group by attempting to adapt his practices to the rules and regulations in the region while utilizing the relative advantages of Bedouin herders over intensive sheep farmers. The herds are closely monitored throughout the day and much effort is invested in securing access to preferred grazing areas and acquisition of other inputs at preferable conditions.

The "transitionalist" adopt more intensive practices than those of the "traditional" groups, although not on a scale representing a significant deviation from the traditional styles especially with relation to long-term production planning.

The "maximizing innovator" manages his herd with similar care for maximizing his advantages over intensive-commercial growers, but he also tends to adopt selectively more intensive and costly techniques, such as the introduction of improved Assaf sheep into his Awassi herd and the use of hormonal synchronization of ewes (thereby raising the annual lambing rate). This management style is long-term goal

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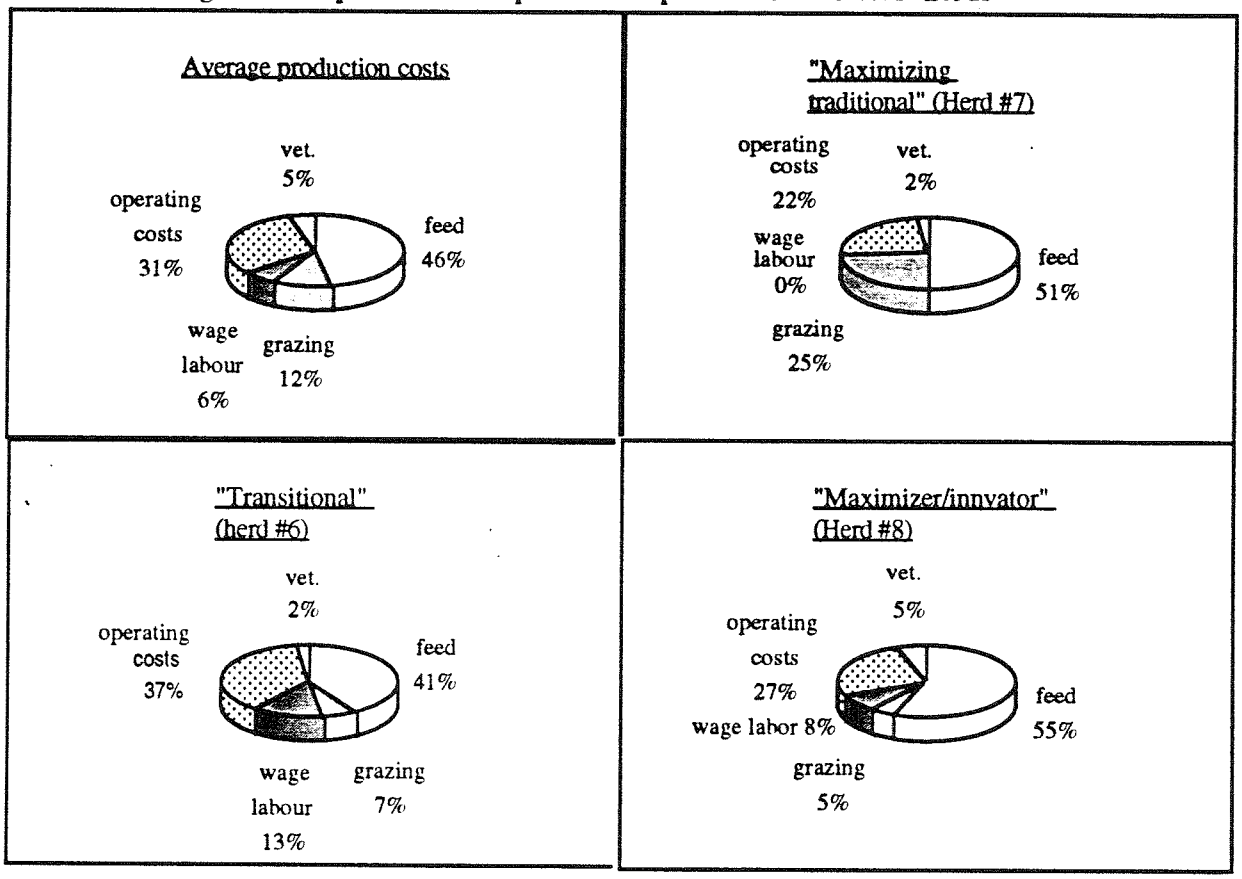
[22] An exceptional case which illuminates the value of connections is a Bedouin who, according to herd managers' reports, has succeeded in acquiring a permit for year-round grazing. Consequently, he spends much less on feeding the herd with other purchased inputs, and his profits are therefore thought to be much higher than average.

[23] An example of connection-maintenance policy is the annual feast which most Bedouins offer to farmers on whose land they graze. These feasts usually entail the slaughter of one or more animals, and the preparation of a full meal for groups which sometimes include dozens of people.

oriented: breeding, rearing, feeding and other treatments are geared towards realization of potential production and obtaining the highest prices for lambs and ewes sold.

An examination of herd expenses according to the different components substantiates the management styles classification presented earlier. A clear difference in the relative importance of various components of the herd expenses can be observed in Figure III.5 between the different groupings, especially in relation to expenses on feed vs. those on grazing.

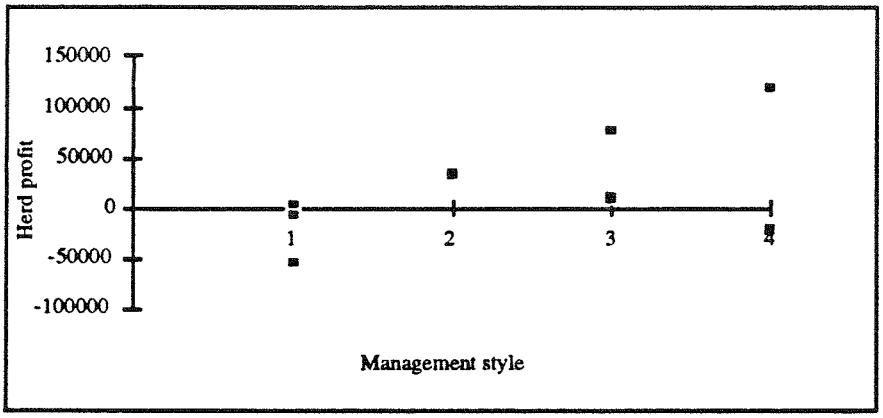
Fig. III.5 - production expenses components in selected herds



Given the small number of herds in each category it would be premature to offer decisive conclusions as to which management style is "optimal" - in the context in which this term is used here. Nonetheless, there seems to be a tendency of increase in herd profits with intensification (see Fig. III.6), which is even more evident if some of the results are amended to resemble a "normal" year (see presentation, calculations and discussion of these simulations in the appendix). Advocating intensification as a direction for improvement of the sector's economic performance should nevertheless be viewed with caution: First, this tendency is accompanied by a similar increase in the use of inputs, and labour. In the absence of an effective extension service and any form of organization among Bedouin herd managers, as well as the absence of either subsidized credit or any form of agricultural risk-insurance schemes for herd-growers, the results of a bad production year could be devastating for a household. Second, in opting for more intensive practices, the Bedouin are entering into competition with intensive sheep growers from the Jewish sector. By doing so, they stand to lose some of their comparative advantage, which is to be found at the other end of the scale - in low-input extensive production methods. Third, existing production practices are located within a confined spectrum - on the one hand, at present the fully extensive production strategy

is not possible, on the other, the intensive practices are limited by the restrictions on construction of permanent sheds[24].

Fig. III.6 - Herd profit in relation to management styles



It would have been expected that different management styles would entail different methods of profit maximization: the "traditional" herders would tend to minimize their production costs, and by doing that would try to maximize the relative advantages of their production techniques, while the "intensive" herders would attempt to get higher prices for their lambs - so as to cover the higher expenses per lamb. In order to test these assumptions, an "efficiency ratio" calculated as: average sale price per lamb/average expenses per mother.

Table III.7 -Efficiency ratios of herd production

Household number	1	2	3	4	5	6	7	8	9
Efficiency ratio	0.86	0.61	1.99	1.13	2.73	1.36	1.8	1.54	0.93

These results were indexed in the following manner:

"1" - low efficiency ratio (less than 1); herds: 1,2,9

"2" - medium efficiency ratio (between 1-1.5); herds: 4,6

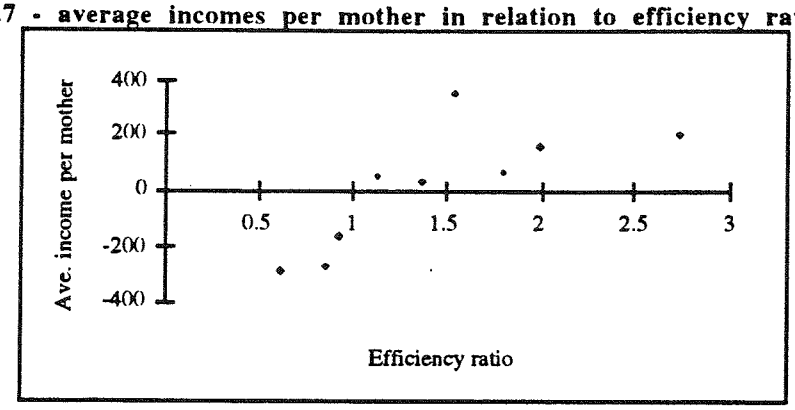
"3" - high efficiency ratio (higher then 1.5); herds: 3,5,7,8

The efficiency ratios seems to correlate quite well with the profitability data, as can be seen by Fig. III.7.

As can be seen from the scores achieved by different herd managers, high efficiency ratio which is assumed to represent the relative degree of success in applying a particular management style, was attained by using different styles. These results could be regarded as an additional support for the notes of caution given earlier with regard to the intensification option as an obvious direction for improvement of present practices.

[24] All herd managers have makeshift sheds in their permanent dwelling which are used mainly in the winter season. Herd managers 8 and 9 have built structures which are slightly better then the nylon-and-wood structure used in other herds. But even those do not have concrete floors, milking machines, storage silos, and other such facilities which help to keep high sanitation standards, and enable better monitoring of feeding and production processes.

Fig. III.7 - average incomes per mother in relation to efficiency ratios



Contrary to the tendencies observed in the previous section, most herd managers pointed out the fully-extensive production strategy as the most profitable practice. The optimal herd size was defined as 500-1000 heads per herd. Most herd managers believe they could manage herds of that size with their presently available work-force. Some stated they would rather raise goats if that was possible[25].

The main limiting factors identified by household heads were, in descending order of importance: restrictions on the herding activity, restrictions on herd sizes (established lastly in 1991), and restrictions on construction of sheds and other related structures in the permanent dwelling areas.

5. Household expenses, incomes from sources other than the herd, and sustainability

In line with previous sections, the following description of the household's economic activities will be limited to a breakdown and analysis of the data collected in the field survey, mainly for the purpose of determining the ability of the surveyed households to sustain themselves. It should be noted that not all expenses related to the household are accounted for directly. Nor were other marginal sources of income or food: most households have goats, chickens, and some have cows and camels. These animals are used mainly as food sources (milk, meat, eggs, etc.), but in some cases - especially in the case of goats - they can also substantiate household incomes.

The standard of living of the households surveyed would be considered basic at best in relation to the general standard of living in Israel: the average daily expenses per capita in the households surveyed was 8 NIS. (or $2.9)[26]. Most households (with the exception of no. 8 and 9) live in tents, with no running water, electricity (apart from generators in some cases), or asphalt roads leading to the dwelling sites. The absence of these facilities is essentially the result of long-standing disputes as to the temporary or permanent status of these sites.

[25] This statement should be viewed with some caution. In recent years the Jewish National Fund has enabled the grazing of goats in groves located in the vicinity of areas VII and VIII. Despite this renewed (and possibly promising) possibility of goat-raising, very few Bedouin herd managers have attempted to do so. This might be attributed to the relative distance of these sites from the permanent dwelling areas, lack of capital, and possibly fears of another reversal of practices in the future.

[26] Such simplistic inferences could be sometimes deceiving, as notions of "quality of life" rather then a mere measurement of daily expenses per capita need to be introduced if two significantly different lifestyles are to be compared. In addition, some kind of "adult equivalent" measure has to be used in order to account for different consumption needs of adults, children, and old people.

(i) Household expenses

Table III.8 - household expenses

Household number	1	2	3	4	5	6	7	8	9
Total household expenses	32030	17530	53200	54800	27440	31880	42800	131100	45430
General expenses (Food, clothing, education, etc.)	26500	14050	49500	38000	19120	31800	19400	59200	32500
Family insurance (Social security, medical insurance)	0	3250	3700	1760	2510	0	0	10100	4520
"Special expenses" (Wedding, party, etc.)	5530	230	0	15040	5810	80	23400	16800	8410
Breakdown of expenses (%)									
General expenses	83	80	93	69	70	100	45	45	72
Family insurance	0	19	7	3	9	0	0	0	10
"Special expenses"	17 (1)	1	0	27 (2)	21 (3)	0	55 (4)	13 (5)	18 (6)

Notes :
(1) expenses on medical treatment, resulting from illness of household members and absence of medical insurance.
(2) expenses of wedding of a son.
(3) costs of *Haj* pilgrimage of the head of household (herd looked after by wife and children in his absence, with the assistance of clan members).
(4) purchase of car for the eldest son.
(5) purchase of new car, financial support for brother studying abroad, expenses on usage and maintenance of the clan's generator.
(6) development of infrastructure at dwelling area (recognized de-facto by the authorities), expenses on usage and maintenance of the clan's generator.

Expenses were divided to four categories: (i) "general expenses" - expenditure related to routine reproductive activities of the household - food, clothing, education, etc.. As can be seen, this category accounts for most of the expenditure in the households observed. (ii) "Family insurance" - this category aggregates two forms of government insurance schemes- social security and health insurance. Three households (no. 1,6, and 7) did not utilize these options, and are therefore at a risk of having to spend substantial sums of money in case one of their members falls ill, or is in need of special treatment of some kind. (iii) "Special expenses" - all expenses not related to any of the other categories, or seen as exceptional in nature were aggregated under this heading.

Three households (4, 7, and 8) incurred expenses which could be seen as "periodical exceptional expenses" - expenses which most probably are incurred in a cyclical nature once in every few years.

(ii) Other sources of income

Table III.9 - household incomes from sources other than the herd, profits and amended profits

Household number	1	2	3	4	5	6	7	8	9	Ave.
Incomes from other sources	0	10880	25020	48000	7600	5120	3000	106200	41400	27469
Net Household profit	-89964	-13954	44572	-9122	6298	-20395	-8764	83975	-34091	-4605
Amended Household profit (1)	**-30137**	**-13954**	66873	11704	6298	**-20395**	16263	83975	4177	11537
other income as % of total income	0%	100	25	93	20	32	8	47	100	77
Breakdown of income sources (as percentage of total "other income)										
Wage labour (%)	-	0	16	4	0	0	0	21	54	5
Entrepreneurship (%)	-	0	0	3	0	2	0	71	0	10
Transfers from family (%)	-	10	0	33	0	0	0	0	0	12
Social security (%)	-	90	84	59	100	98	100	8	45	73

Notes:
(1) See appendix for calculation of amended household profit, and discussion on criteria for such amendments in the following section.

Four possible kinds of non-herd income sources were identified in the survey. Two of them, wage labour and entrepreneurship can be regarded as "active" forms of income generating activities, while the two other categories are regarded as "passive" - i.e. not requiring additional investments of labour and other inputs.

The activities contained in the first category, wage labour, denote paid work of one of the household members, the returns of which were added to the household pool of resources. In three cases (households 3 and 4), the heads of household worked in agriculture during the spring and summer seasons (an option made possible partly due to the fact that women are employed in herding in these households). The other reported wage labour (households 8 and 9) were related to regular jobs of the herd-manager's brother (no. 8) and son (no. 9), who are also partial owners of the herd.

The second category - "entrepreneurship" - under which all other "active" forms of income generation was collected, recorded only three households (4,6 and 9) which reported such activities. Of these, two (of households 4 and 6) were insignificant in economic terms. The third case, that of household 8, represents an exceptional (though not entirely unique) case of diversification. The herd-manager was involved in tourism (a Bedouin hosting tent for organized tourist groups), contractorship (employing other Bedouin in seasonal agriculture in a Kibbutz near the grazing site), and commerce (mainly in sheep bought from other herd-managers).

Transfers from non-household family members were recorded in relation to the smallest herds (2 and 4), a fact which can substantiate the comments made on the relationship between herd-size and profitability.

Social security transfers - refer mainly to child and disability allowances and pensions (of elderly parents). In two cases (households 6 and 7), these payments were received even though no social security payments has been made.

(iii) Net household profit, sustainability and degree of dependence on the herd

The results presented in Table III.9 indicate that five households (no. 1, 2,4, 6, 7 and 9) had a net loss at the end of the production year, and three of them (1,2 and 6) incurred a loss even after amending

calculations (carried out by excluding exceptional purchases, events, or extraordinary production failures, see appendix for further detail) - which means that they failed to accomplish the assumed principal objective of their activity - securing the household's viability. If these results are indicative of future patterns of incomes and expenses then these households would not be able to sustain themselves independently (or with the existing degree of dependency on external income sources).

The first question which might arise in light of these results is "how do they then manage to keep their households"? The possibility of biases and misinterpretation, although probably existing to some extent, does not suffice as an explanation of this inability to achieve the basic goal. More probably, each household has some capital reserves, either in the form of cash, loans to be returned or other forms.

In addition, the results of only one annual cycle do not necessarily represent longer-term tendencies. In an attempt to account for this short-coming a "sustainability index" was devised, based on internal and external connections, existence of social security schemes, production capacity of the herd (under present herd sizes and conditions), and existing and potential availability of other sources of income.

Three degrees of sustainability were defined:

At risk; households: 1,2. These household are not able to secure their existence given their present sources of income, and are therefore dependent on others for their survival.

At potential risk; households: 5,6; These households are either only partially insured in official schemes, they have no additional sources of income to the herd, have weak internal and external connections, and their existing production practices seem to offer only a marginal income.

Sustainable existence; households: 3,4,7, 8, 9. Despite losses of some of the households included in this category, all of the above are either secured by a steady income from government sources and/or family members, or have internal income-generating capacities that can sustain them.

A second index devised in relation to the household was "degree of dependency", which denotes the degree of reliance on the herd as a source of income by calculating the percentage of "other incomes" from total incomes of each household. The following categories were used:

"dependent" (grade: 1) - 100-76% of total income coming from the herd; households: 1,5,7

"semi dependent" (grade: 2) - 75-51% of total income coming from the herd; households: 3,6,8

"semi independent" (grade: 3) - 50-26% of total income coming from the herd; households: none

"not dependent on herd" (grade: 4) - 25-0 % of total income coming from the herd; households: 2,4,9.

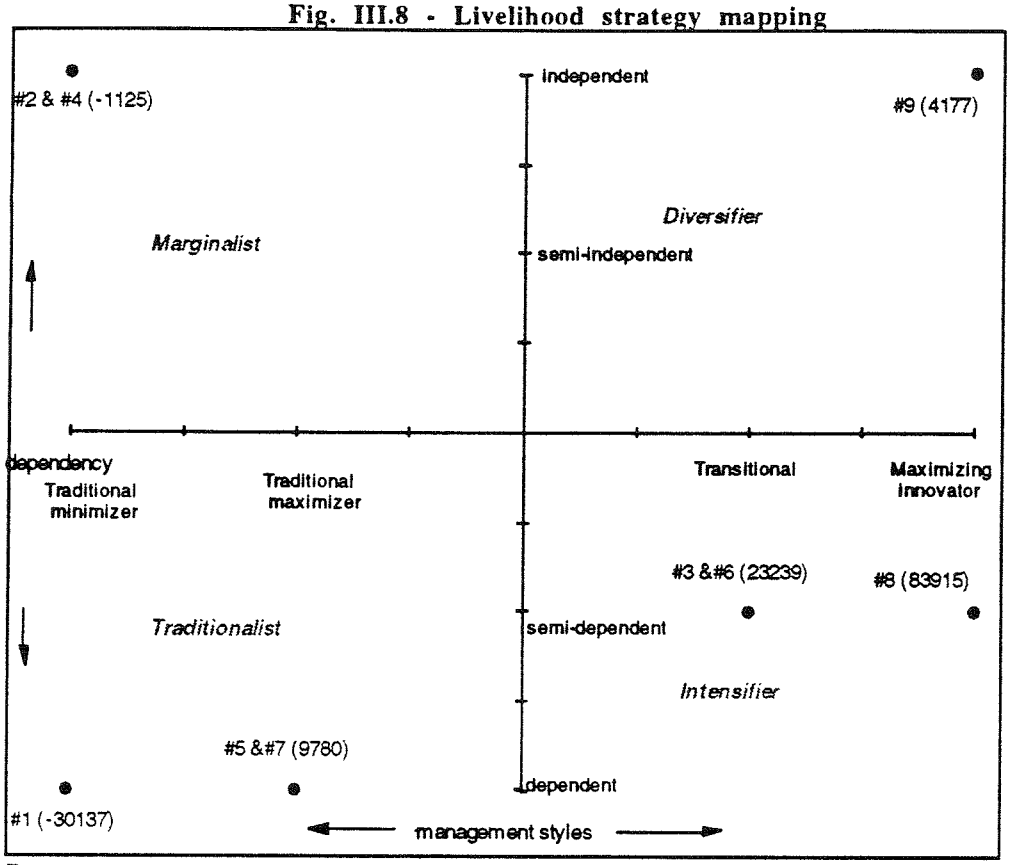
6. Livelihood strategies - definitions and discussion

The method used for defining livelihood strategies among the households surveyed was based on a similar method of Bennett (1980). The "management style" and that of "degree of dependence" indexes (see table III.10) were placed on an X-Y plane to create four sectors, each representing a different livelihood strategy. The overall economic performance of households in each cell was used as the basis for the discussion of the viability of each strategy.

Table III.10 - criteria used for livelihood-strategies mapping

Household no.	1	2	3	4	5	6	7	8	9
Management style	1	1	3	1	2	3	2	4	4
Dependency on herd	1	4	2	4	1	2	1	2	4

Fig. III.8 - Livelihood strategy mapping



Dots represent household positioning. Numbers (e.g. #1) depict specific households and amended profits for each of them appear in brackets next to household numbers (in case of more then one household occupying the same position, the average of the two is given).

The usage of these two indices - one acting as a generalized summary of the herding management practices/styles, and the other acting as an approximated measurement of the herd's economic (though not necessarily social, cultural, political, etc.) importance for the household - creates four cells which define four hypothetical strategies: "traditionalist" - a household relying almost solely on herding, using mostly "traditional" herding practices, "marginalist" - a household for which herding is relatively marginal as a source of livelihood, and therefore relies on other sources of income to secure its existence, "intensifier" - a household in which the herd is an important source of income, and which uses intensive raising techniques, and the "diversifier" household which, while using intensive raising techniques, has other significant sources of income.

The results suggest that: (a) the most profitable livelihood strategies are the ones positioned within the "intensifier" cell, and (b) that at present, the more extensive types of livelihood strategies cannot maintain a household. The seemingly obvious conclusion that the present - and therefore implicitly the future - of the Bedouin herding lies in the intensifying/diversifying combination, needs to be viewed with some reservations: First, the "innovation-cum-intensification" option is not a viable possibility for all households - due to personal limitations, lack of resources, or both[27]. Second, the production strategies defined as extensive in this paper are rather "confined cost minimizing". As none of the households surveyed grazed its herd throughout the year, there is a possibility that a genuinely extensive practice might have proven to be economically viable.

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[27] '...the wealthiest quintile [of an agricultural community] innovates most rapidly, having more resources to invest and being better able to recover, should the decision be a disaster. The lowest quintals innovates the least, whether being unable to risk or "refusing to compete".' (Barlett, 1980: 556)

IV. SUMMARY, CONCLUSIONS, AND POSSIBLE POLICY IMPLICATIONS

In the previous chapters I've attempted to offer a view of various aspects of the livelihood practices of Bedouin herd-owning households. This short concluding chapter will be devoted mainly to discussing possible improvements to the present practices of Bedouin herders; by so doing I shall attempt to carry through the last of the stated objectives of this paper.

The results of this study seem to suggest that even under the existing conditions, the herding activity is economically viable. At present most households manage to support their large households with little or no support from official sources. Even if other aspects related to the possible elimination of the Bedouin herd-owning sector (social, political) are not taken into consideration, the possible cost of supporting these households in the absence of herds as a source of income could easily be calculated to be formidable in comparison to alternative measures of supporting them[28]. This sort of argument does not necessarily entail that assisting the herding sector is the best of possible options which might still be able to maintain the Bedouin culture; Bedouin villages, discussed earlier, offer another hypothetical alternative.

More general arguments in favor of "developmental intervention", pertaining to the Bedouin society as a whole, relate to the place of herding in the Bedouin way of life. Although most of the Bedouin population is not directly involved in herding anymore, the existing herds still play an important role in the Bedouin society - either through indirect benefits (commerce, savings, etc.), or as one of the symbols of identity. The grievances of the herd-owning households are therefore not only the domain of those affected directly, but of the Bedouin society as a whole. The possible social and political cost of termination of this activity by government regulations, or lack of assistance, might be heavier than expected.

Offering possible ways of intervention which would be directly related to the analysis presented here will necessarily fall within the technical realm. This intentional choice does not necessarily opt for this level of intervention as being the best, or only one possible; it rather offers a set of policies which could be implemented almost immediately, and would not require radical changes in the present patterns of land ownership and agricultural practices in the Negev.

As I have stated earlier in this paper, the existing practices of Bedouin herders are confined both in the direction of intensification and that of extensification; possible interventions should therefore be geared essentially towards widening the spectrum of possible herd-raising practices. Such possible policy interventions include:

(i) Expansion and regulation of access to grazing sites - the process of obtaining grazing permits should be re-examined, improvement of pasture quality by fertilization and other methods considered, and herd-managers should be encouraged and assisted to utilize newly-available grazing sites outside the Negev region. Incorporating agro-pastoral practices, as an addition to existing rain-fed agriculture, should be promoted among Jewish farmers in the region[29]. The possibility of leasing grazing-sites for longer periods of time (either for a year-round grazi ng or for consecutive seasons) should also be considered.

Recent views on the beneficial role of goats in preserving the ecological variability of Mediterranean woods and in the prevention of forest fires are leading to a change in government policies towards goat-grazing. The shift (or return) of some households to goat raising, which could be beneficial to

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[28] A simple example of such a calculation would be to compare the cost of assisting the households in know-how, credit, etc.; and the costs of unemployment benefits for a household of 10 people or more.

[29] Spharim & Seligman (1988), who examined various theoretical agro-pastoral scenarios for the Northern Negev region, concluded that 'Comparison of the model results with actual practice in the region shows that very much less cultivable land is used as pasture than is indicated as optimal in the model. In fact, removing sheep from the cultivable land reduces the [profits from this land]...by almost half.' (Ibid.: 23)

all sides, could be encouraged by providing long-term concessions to particular plots within woods, and possibly by providing direct financial and professional assistance.

(ii) Improvement/enhancement of extension services - under the present situation, characterized by non-existing or unsatisfactory extension facilities, attempting to improve existing practices is reserved only for the more articulate and able herd-managers (who lack sufficient knowledge in most cases). As both sheep-raising extension and research facilities exist in Israel at present, a relatively inexpensive scheme could fill the existing knowledge-transfer gap.

(iii) Agricultural credit/insurance schemes - lack of sufficient capital, and inability to shoulder risks entailed by innovating existing practices are other factors which possibly contribute to the absence of relatively simple improvements in herd production (e.g. hormonal synchronization, disease prevention, etc.). Developing a credit/agricultural insurance scheme for Bedouin herd-managers should not be too difficult, given the fact that similar schemes exist in other branches of the agricultural sector.

(iv) Intermediate solution to the erection of sheds and other related structures - even under the present vagueness which exists in regards to the status of the Bedouin dwelling sites, allowing for the erection of temporary structures and assisting in designing easy-to-use modular structures might greatly reduce lamb mortality, and form a significant improvement in the profitability of many herds.

Concluding remarks

As mentioned in the preface to this paper, "traditional" livelihood strategies are not static sets of practices, they are a result of economic, social, political and cultural considerations. Policy interventions, whether micro or macro in scope, can only relate to a limited range of these realities. Any policy intervention introduced alters reality (as it is viewed by the its target population) in unintended ways, and therefore generates reactions and changes which could be neither anticipated nor desirable to the policy makers. This should not of course be taken as a warrant against such interventions. It should rather point to the importance of the motivations for such interventions as a crucial element in initiating and implementing them, and to the need to incorporate Bedouin herders in the process of problem identification and policy formulation processes. I'd like to conclude this paper by suggesting the time has come to look at the "Bedouin challenge" and not the "Bedouin problem"; their herding practices viewed not as a remnant of past practices, but as a viable activity within the modern-day economy of the state of Israel.

APPENDIX I: AMENDING CALCULATIONS FOR VARIOUS HOUSEHOLDS

1. Household no. 1

The household's herd was hard hit by a disease which killed all of the lambs born in the winter season, and 14% of the mature herd. In order to simulate an "average annual production" situation the following assumptions were made:

Birth rate: 85%; adult mortality: 5%; lamb mortality: 8.3% (the mortality rate of the other herds surveyed); 95% of the lambs are sold during the annual cycle, no change in herd inventory (lamb replacements compensates for adult mortality); no change in herd and household expenses.

Under these assumption the Herd income is NIS 5631:

Number of sheep conceiving (excluding adult mortality): 234*0.95 = 222

Number of lambs born: 222*0.85 = 189

Number of lambs reaching maturity: 189*0.917 = 173

Number of lambs sold: 173*0.95 = 164

Returns from sales: 164*386 = 63269

Herd income: 63269-57638 = 5631

Net household income: 5631-32030 (household expenses) - 3738 ("interest") = -30137

2. Household no. 3.

This household's herd was also affected by the disease which hit herd no. 1. This household lost 70 mature sheep and 30 lambs. In order to carry out a similar simulation, the following assumptions were made: 65 of the sheep which died from disease were added to the herd (6% adult mortality), in order to calculate the amended change in inventory the averaged price of ewes and hoggets - 337.5 NIS was used as the exact percentage of sheep of these two types which died was not given; 27 of the 30 lambs which died (10% lamb mortality) were assumed to be sold at the household's average price: 437 NIS; other incomes and expenses unchanged. The results show that the net household income under these assumptions would be 66873:

Total sales: 87550+(27*437) = 98038

Total production costs: 11687- (35*337.5) = -125.5

Herd income: 98038 - (-125.5) = 98136.5

Net household income: 98136.5 - 53200 (household expenses) - 3111 ("interest") + 25020 (other incomes) = 66872.5

4. Household no. 4.

This household incurred exceptional costs of close to 20000 NIS due to a son's wedding. The amended calculations were therefore meant to exclude all the expenses related to the wedding: out of the 14 lambs slaughtered, 10 were assumed to be sold at a price of 300 NIS (the average sale prices of June 1992), 4 lambs were assumed to be slaughtered as "interest, and were added to the expenses at the price of NIS 359 (amended sale price of the household); expenses on feeding lambs brought by family and friends to be slaughtered at the wedding (calculated to be around 486 NIS) were deducted; other direct expenses, adding up to 16000 NIS were also deducted; other expenses and incomes unchanged:

Total sales: 9200 (300*10) = 12200

Total production costs: 5394 - 864 = 4530

Herd income: 12200-4530 = 7670

Household expenses: 54800-16000 = 38800

"interest": 4*359 = 1436

Net Household income: 7670 - 4530 - 38800 - 1436 + 48800 (other incomes) = 11704

4. Household no. 5.

The expenses on purchasing a car for the eldest son were added to the Household income: -8764 + 25000 = 16236

5. Household no. 9.

Despite the usage of synchronization, the birth rates in this household's herd were low even in comparison to herds which didn't use this method. It was assumed that such a failure is exceptional, and the birth rate was amended. The rate used was an average of those of herd no. 9 and 8 (the other herds which implemented hormonal synchronization). Average sale price (and "interest") used was 463 NIS. The resultant net household income was found to be:

No. of lambs born: 129*1.235 = 159

Number of lambs reaching maturity: 159*0.92 = 146

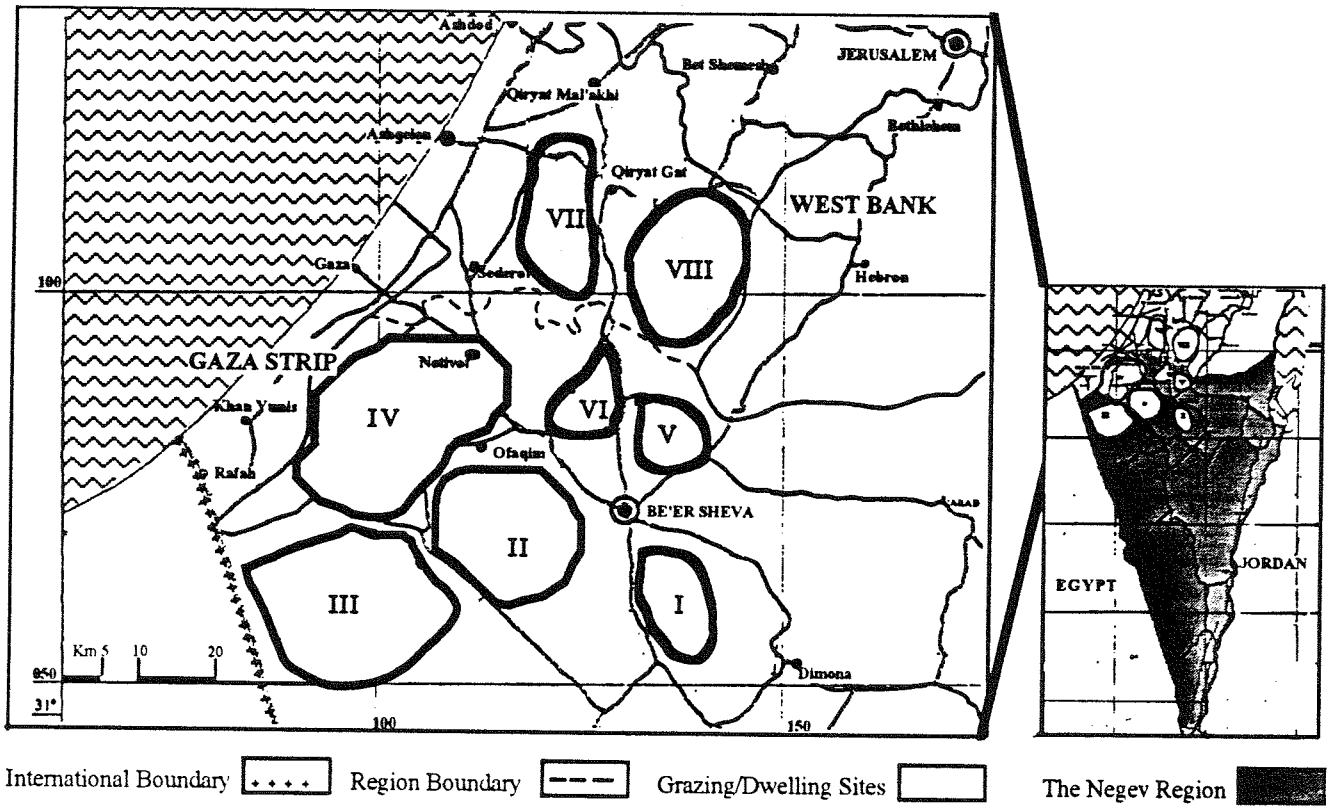
Number of lambs sold: 146-15 ("interest") = 131

Returns from sales: 131*463 = 60653

Herd income: 60653 - 45501 = 15152

Net household income: 15152-45430 (household expenses) - 6945 ("interest") + 41400 (other incomes) = 4177

APPENDIX II: MAP OF DWELLING SITES AND GRAZING AREAS



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