

1 INTRODUCTION

1.1 Justification

It is well known that the transfer of modern technology to traditional agricultural farming systems usually fails (Chambers et al., 1998). The question arising out of this situation is what are the constraints or reasons behind these failures and whether it is reasonable to try to overcome this situation and how. Although in some cases improvement succeeded or innovations have been adopted, it is difficult to transfer conclusions from one site to the other as the environmental, economic, social and other factors are different between sites.

In that respect, sheep production in Israel is unique. While in most regions of the world, sheep production has rather uniform management, in Israel a wide range of sheep production systems, from traditional nomadic to the most intensive dairy production, can be found in close vicinity and under the same economic background. Those production systems differ in many respects e.g. in the degree of movement, the breeds used, the reproduction, feeding and health management as well as by the social framework they are incorporated in. This was not always the situation, as before the increased remigration of the Jewish people to Palestine by the end of the 19th century and the re-establishment of the state of Israel in 1948, sheep production was solely based on the traditional nomadic system, which allowed the utilization of the scarce and erratic resources for animal husbandry in this semiarid and arid environment.

Starting from that period a still ongoing improvement of the traditional sheep production systems in Israel has been carried out, driven initially by an intensive genetic improvement of the native Awassi sheep. While all producers have been under the same economic conditions and exposed to advances in production technology and management, not all parts of the sheep production sector in Israel were involved in this process of modernization. It occurred mainly in the Jewish part of the sector and less among the Bedouins in the south of the country, which nowadays still practice a relative extensive way of sheep farming. Although sheep farming plays a minor role in the Israeli economy and even in the agricultural sector, it is a crucial source of income and employment in the Bedouin population, who still keep the majority of the sheep stock in Israel today.

Studying sheep production in Israel as well as its natural and social-economic framework may provide some answers to the question, why sheep farming systems of very low input allocation still exist in close vicinity to highly intensive production systems; whether it is feasible and at all desirable to transfer the advances in breeding and management to the whole of sheep production systems in the region and to identify some of the constraints and limitations for such a process.

1.2 Aims and objectives

The aim of the present study is to collect and summarize the existing information concerning the sheep farming sector and its framework in Israel in order to understand the reasons and the rationale behind the wide diversity of sheep production systems found in Israel.

Specific aims are:

1. To describe and characterize the different sheep farming systems in Israel with regard to the form of production and to the natural and socio-economic framework. Hereby to identify and to classify different production and husbandry systems and to describe their importance and regional distribution.
2. To develop an adapted methodology for the analysis and classification of sheep farming systems of the region, which allows to compare the management practices and output levels of the different systems.
3. To pre-test the methodology for analysing and classifying sheep farming systems in a case study in Israel.

The results of the present study may be applicable to Middle East regional projects aiming to improve sheep production by providing a description and classification of sheep farming systems in the region and by identifying some constraints and targets for development.

1.3 Structure of the study

According to the aims, the present study is divided into three main parts: (i) a literature survey part (chapter 2, 3.1 and 3.2); (ii) the development of the new approach and methodology for the definition of intensity and its application for classification of sheep farming systems in Israel (chapter 3.3) and (iii) the case study (chapter 4), in which the methodology is pre-tested. Finally, the possible reasons for the diversity of the sheep-farming sector in Israel are discussed (chapter 4.4).

While chapter 2 is solely based on literature, in chapter 3 the references are complemented by unpublished information gathered through informal surveys and interviews with key persons during a first visit in Israel. The case study is based on a formal survey of 15 sheep keeping farms in Israel.

2 SHEEP FARMING SYSTEM ANALYSIS (literature review)

2.1 The concept of livestock farming system (LFS) research

A system can be defined as “a group of interacting components operating together for a common purpose, capable of reacting as a whole to external stimuli: it is unaffected by its own output and has a specific boundary encompassing all significant feed backs” (Spedding 1996). (Morley 1972) defines a system of production as “a dynamic set of inputs and outputs, with a connecting structure of inter-related processes and products, all lying within defined boundaries”. According to this definitions, agriculture, animal husbandry and in our specific case sheep husbandry, can be understood as applying management practices to biological systems in order to profitably produce one or several products (Forbes and Oltjen 1986). Systems are developed by and for man, and so are also greatly influenced by the social and economic environment in which man finds himself within the ecological zone (Coop and Devendra 1982), (Gibon et al 1996). The importance and the determining influence of the social context in which a LFS operates has been widely recognized (Maxwell 1996), (Bourbouze 1995), (Flamant and Boyazoglu 2000) and especially emphasised for the case of small ruminant production systems in the Near and Middle East (Qureshi 1987), (Gall 1989). In addition, the ecological production-environment of Mediterranean countries is particularly fragile, so that the intensification of traditional animal production systems to meet the demand of an increasing population cannot be isolated from the natural framework (Flamant and Boyazoglu 2000).

A simple graphical model of a livestock production system and its interrelationships is given in figure 1. It shows the livestock farm as a dual entity, associating a human activity system and a production process (Gibon, et al. 1996). In our specific case the biological system represents the sheep, transforming physical inputs like fodder and water into physical outputs like meat, milk, wool, hides and manure.

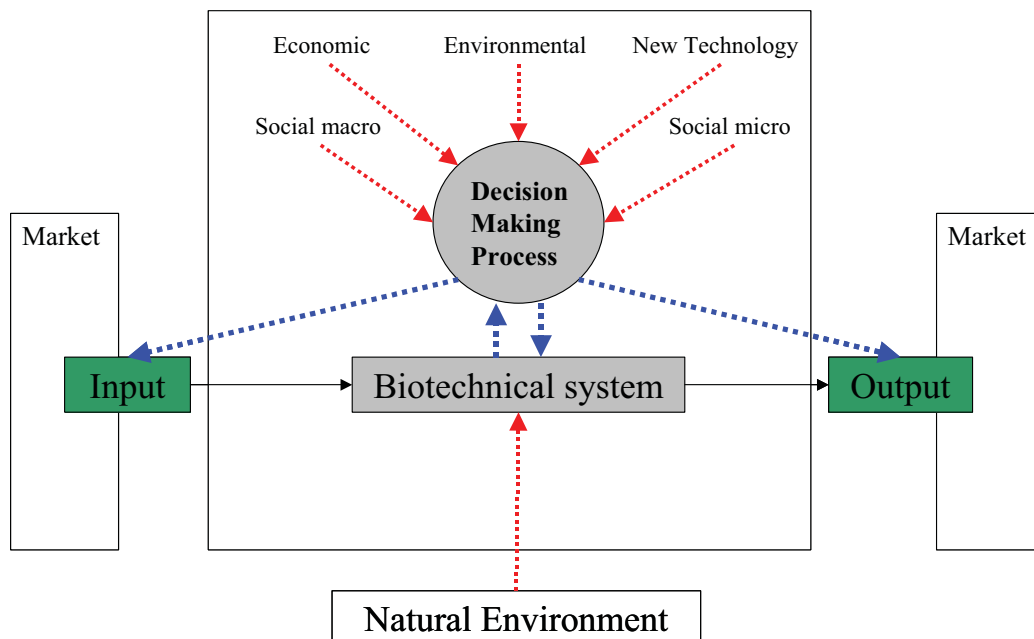


Figure 1: Graphical model of a livestock production system

Source: modified after (Maxwell 1996)

This view of livestock production systems determined the structure of the present study, which aims to incorporate all the elements influencing sheep production in Israel, especially the decision process of the farmer determined by his social and natural and economic framework, rather than dealing with sheep production as an isolated phenomenon.

In the literature, the procedure of a LFS approach is divided into different numbers of stages of activity according to the specific case of the author (e.g. (Bourbouze 1995), (Stroosnijder and Van Rheenen 1993)). Nevertheless, if a LFS approach is applied, three general stages of research can be identified (Fitzhugh 1987):

A. Diagnostic phase:

1. Characterization of the system: production environment, resource inputs, product outputs, operational processes and interactions among them.
2. System analysis for the identification of constraints and limitations of production.

B. Experimentation phase:

3. Derivation and testing of possible solutions.

The experimentation phase contains the traditional animal science methodology, where hypotheses are formulated and tested in computer models, on experimental station or in on-farm trials. The present study only deals with the diagnostic phase. This phase is essential to derive relevant research questions and to formulate relevant hypotheses and is usually crucial for the success of the following steps (Fitzhugh 1987). So the aim of the study is to understand and to describe the diversity of sheep production systems found in Israel and the reasons, why modernisation and improvement of production has not reached all farms.

According to (Collinson 1987), the output of a good diagnosis will include:

1. The identification of problems (with priority ranking) for which experiments may be done.
2. Assessment of the extent in which certain technological innovations are suitable for the system.
3. A description of the characteristics of target group farmers and farms as a basis for the choice of representative locations where on-farm experiments may be executed.
4. A description of current husbandry practices for setting the levels of non-experimental variables for experiments to be done by scientists and for evaluating farmer management.
5. An assessment of the possible ways in which the farmers will judge the results gained from the experiments.

The methods and approaches to generate this information in the diagnostic phase of the LFS approach are manifold. The following chapter aims at describing them briefly and justifying the selection of methods applied in the present case study.