

6

Characteristics of Smallholder Low-input and Diversified Livestock Keeping

Learning Objectives: Understanding

- The characteristics of low-input and diversified livestock keeping
- The challenges and potential of this livestock-keeping strategy

As indicated in Chapter 5, within the smallholder system, two kinds of livestock-keeping strategies can be identified: the *low-input* and *diversified* livestock keeping and the *more specialized* livestock keeping (Fig. 6.1) of one selected species.

In this chapter, we will focus on the first of the two strategies: low-input and diversified livestock keeping. The characteristics, advantages and challenges of more specialized livestock-keeping strategies are presented in Chapter 7, whereas in Chapter 8 the process of transition from a low-input to more specialized strategy is described.

Characteristics of Low-input and Diversified Livestock Keeping

Smallholders and pastoralist systems are the most frequently used farming systems in the world, especially by the rural poor, and most of them are based on low-input and diversified strategies. Low-input and diversified livestock keeping has existed for thousands of years and still holds strong

today. It forms the basis of a relatively effective and sustainable production system under circumstances of isolation, insecurity and change. The following are the major characteristics of this form of animal husbandry (van't Hooft, 2004).

Manual labour often from women and children

Many women are alone with their younger children during a good part of the year with the responsibility to carry out the activities of animal husbandry (Fig. 6.2), crops and chores at home. This can be because of seasonal work or migration of their spouses or sons, or loss of family members because of disease.

Logic of low investment and low productivity of food products

This system of animal husbandry is characterized by little investment of money and

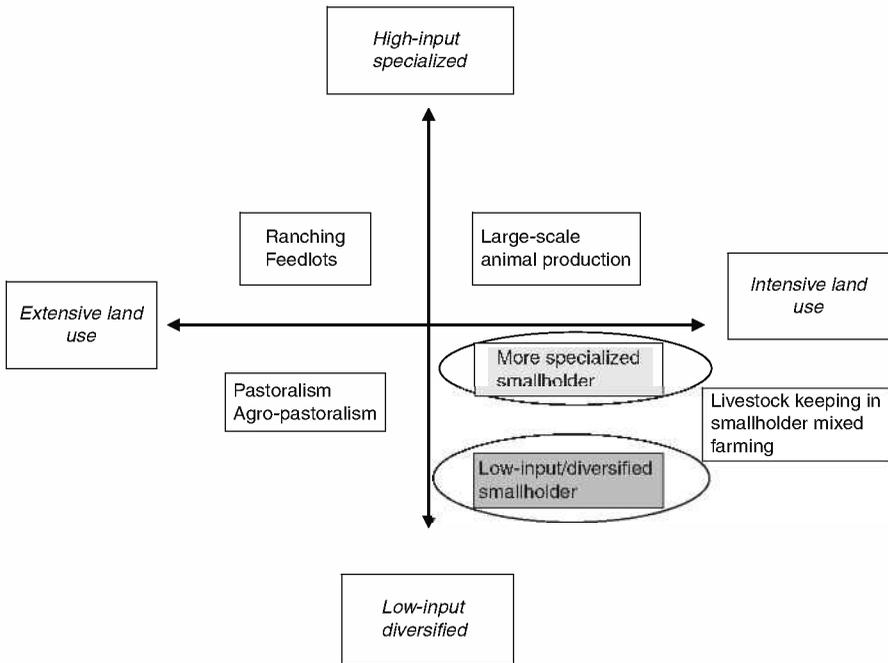


Fig. 6.1. Within the smallholder system, two kinds of keeping systems can be identified: the diversified and low-input system, and the more specialized keeping of one selected species.

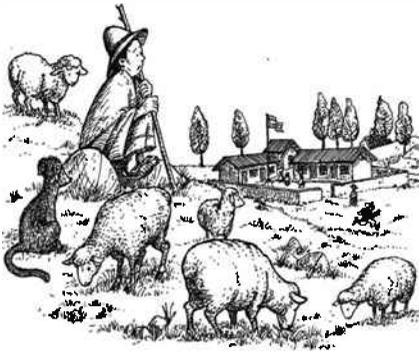


Fig. 6.2. Many children cannot attend school because they have to take care of the animals or do other chores. This is especially the case when the animals have to be herded.

manual labour, resulting in incomplete management from the technical point of view. As a result, the per animal production with respect to food products such as meat, milk and eggs – and *expressed in product per*

animal per day or year – is lower than more specialized systems. At the same time, mortality from malnutrition, lack of protection, parasites and infectious diseases is usually much higher. The concept of ‘productivity’ in this husbandry system is based on the numbers of live animals rather than the level of per animal production per day or year. That is why improvements in this system need to be focused on reducing mortality (Chapter 9).

High potential for improved poverty alleviation and food security

It is important to appreciate the potential of the low-input and diversified livestock-keeping systems in terms of poverty alleviation and food security. The low production from animals is achieved with minimal costs, which translates into relatively higher net gains and significant returns (Fig. 6.3).



Fig. 6.3. Smallholder low-input livestock systems have their own ways and strategies of marketing. Chicken and ducks are raised with minimal costs and sold very easily for a good price in Cambodia.

Moreover, the lack of attention to this system in the past leaves much room for improvement. If optimized effectively (Chapter 9), low-input and diversified systems can be extremely efficient systems, especially in marginal conditions (ANTHRA, 2008).

Raising different species of animals at the same time

In order to reduce the risks of husbandry, different species are often utilized together, each one with specific functions. When one species is affected by disease, for example chicken because of Newcastle disease, other species – such as ducks – will survive (Fig. 6.3). Raising various species together is therefore a conscious risk-spreading strategy. It is also important to emphasize that value of each species of

animal is relative, depending on many factors such as climate, availability of food, cultural and personal factors, the quantity of animals and disease.

Wide variety of animal husbandry forms

Within low-input and diversified animal keeping, there are many different ways of raising each species of animal, depending on the ecological zones, market opportunities and labour available. For example, there is not just a single way of raising pigs; rather there is much variation depending on the characteristics of each family, and their resources and experience. Below are some examples from livestock keepers in the Bolivian Valleys (van't Hooft, 2004).

- Many families raise one or two pigs to fatten and sell when they need cash, for example for schoolbooks for their children. These 'piggy bank pigs' are fed with leftovers from the harvest and the kitchen. Other families raise a larger number of pigs because they operate a local chicha (local maize drink) brewery, which is generally completed with a purchased supplement, such as rice bran; for example, families that make chicha at home, or with a restaurant.
- In the case of sheep, many families in the valleys of Bolivia have some sheep leashed out and take feed to them or they leash them around agricultural fields. In high-altitude zones, families generally graze their medium or large flocks every day.
- Similarly, there is much variation in diversified husbandry of poultry. The majority of farm families keep chickens around the house, or in other instances, ducks, turkeys or geese for their own consumption. Other families raise a certain quantity of chickens or ducks with leftovers and purchased grains to sell part of their production in the market. It is also common to raise semi-wild doves in the valleys of Bolivia to take advantage

of their meat, which has culinary and medicinal values. Intensive husbandry of fighting cocks is usually an activity of men.

- In the case of bees, some families raid wild hives, extracting honey once a year – destroying the hives in the process. Other families raise the bees in rustic hives to take advantage of the honey several times a year. Others purchase improved hives or have adapted their rustic hives with elements of improved hives in order to sell the honey and by-products such as pollen, wax and propolis.

Predominant use of local breeds

In low-input and diversified smallholder and pastoralist systems, local breeds are most commonly used, because they are best adapted to local circumstances. Even though their production of traditional products (meat, milk and eggs) is relatively low, their efficiency is high, as they produce on the basis of low-quality foods and low costs (Fig. 6.4). These breeds are also adapted to the existing cultural factors of the zone, standing at the basis of local dishes, rituals and cultural expressions (FAO, 2009).



Use of non-traditional by-products

By-products from the animals such as wool (Fig. 6.5), manure, blood, hide, bones, fat, horns, intestines, bladders, fetuses and feathers are utilized for a multitude of uses in the home, in the kitchen, for marketable crafts, and for cultural or medicinal purposes. In some cases, animals are raised especially for one of these specific uses.

Limited relationship with the monetary market and technical services

Low-input and diversified husbandry is based on locally available products and is directed toward personal family consumption and the sale of some surpluses. For this reason, the relationship between this type of husbandry and the monetary market is limited. In the case of necessity, sale or barter, the latter is done via vendors that come to the house or by taking the animals to the local fair. The consumer sometimes prefers products from local breed animals rather than products originating from specialized husbandry. The use of technical services in diversified husbandry is generally limited to large animals such as cows, in situations in which the animal is at risk of

Fig. 6.4. Local Chiapas sheep thrive relatively well under local conditions in southern Mexico. Projects to replace these sheep with exotic breeds have resulted in failure. Credit: Paul Perezgrovas Garcia.

losing its life. Measures to prevent diseases or to increase per animal production are usually applied to animals that generate monetary investments, such as cattle or pigs, or fighting cocks in certain cultures (Mathias *et al.*, 2010).



Fig. 6.5. Shepherdess in Chiapas, Mexico, selling a garment made of the special wool of her Chiapas sheep.

Strong interdependence between crops and animal husbandry

Diversified animal husbandry is combined with crops that are fertilized with manure, animals used for draft and transportation (Fig. 6.6). In addition, animals convert agricultural by-products into high-value food products. Leguminous crops for the animals, such as lucerne, are important elements because the plants stimulate the fertility of agricultural lands.

Husbandry based on farmer and ethno-veterinary knowledge

Diversified animal husbandry is based on the experiences and knowledge (Fig. 6.7) generated over generations in families where the traditions have been practised. The use of western science, such as vaccinations and commercial veterinary medicines, is limited and these practices are utilized more with species that generate monetary income (FRLHT and Tanuvas University, 2010).

High flexibility through the purchase and sale of animals

There is high flexibility in this type of husbandry because diversification allows different



Fig. 6.6. In smallholder agriculture, crops and livestock are effectively combined. Leguminous fodder and maize are intercropped; animal manure is used for fertilizing the maize field.



Fig. 6.7. Exchanging knowledge about the use of ethno-veterinary practices is one of the ways to effectively support low-input livestock keeping without increasing the costs. Here local healers of the Cameroon Ethnovet Council of Experts show their experience on the use of medicinal plants. Credit: M.N.B.Nair.

strategies according to the situation that is presented. For example, in the case of needing medicine for a sick child, a chicken can be sold; and when a lot of money is required for a burial, a cow can be sold. When there is an infectious disease in the chickens, it is common to sell all of them in order to prevent greater losses. When the disease has passed, chickens can be bought again. Or ducks can be raised, which are more resistant to infectious diseases.

Reduced flexibility in the case of big changes

When families experience radical changes in their surroundings, low-input and diversified animal husbandry does not adapt easily. For example, in Bolivia, families that have migrated from the high plain to the tropical zones to plant coca leaf generally keep their chickens without any type of protection against the rains, as is the custom in their places of origin. Families originating from the tropical zone protect their chickens with simple, effective constructions. Sometimes, recently arrived families learn to adapt their management strategies to their new surroundings, but often this is not the case because of limited exchange between the two population groups (van't Hooft, 2004).

Limited formal attention

Unfortunately, it is still common to find a lack of information combined with a level of disdain from research and formal education institutions towards low-input and diversified agricultural systems. This leads to inadequate attention to these systems (Mathias, 2010). Moreover, when government services are privatized, this results in further neglect of these agricultural systems. In addition, there are few medications and products adapted to this type of husbandry, and if available, their quality is often questionable. Commercial products, such as vaccines, parasite medicines, vitamins and minerals often come in large quantities that are uneconomical and difficult to use for smallholder livestock keepers.

Vicious cycle of poverty and small land holdings

Under conditions of growing pressure on the land and low soil fertility, diversified agricultural/livestock production can enter into a vicious cycle. When the number of animals necessary for crop fertilization cannot be maintained because of lack of land, the fertility of the land decreases rapidly to the point that agricultural production goes below subsistence levels. Certain species are culturally identified with poverty and indigenous

Box 6.1. The risk of rabies (van't Hooft, 2004).

Rabies is officially recognized as a neglected zoonosis by the World Health Organization (WHO, 2005). Rabies is caused by a deadly virus that can be carried by any warm-blooded animal. In developed countries, it is found most commonly in wild animals, such as coyotes, foxes, raccoons, bats and skunks. In less developed areas where vaccination does not cover all dogs, these canine species are most often the biggest threat to humans. In many rural and urban settings, there are large numbers of dogs that mainly stay on the streets. Rabies can also infect livestock, in both low-input and more specialized systems. Cattle are thus another source of infection for humans. Infection is also possible through the bite of a vampire bat.

In such regions, it is not uncommon to have cases of rabies in humans each year. Once a person begins showing symptoms of rabies, the disease is practically always fatal. Thus, a regular vaccination programme for dogs is a very important community public health practice. In areas of frequent problems with rabies, the same vaccine is also administered to cows and other farm animals.

populations; in Bolivia, for example, these are goats, llamas and guinea pigs. This may hamper the efforts to work with these species.

Includes urban livestock keeping

Residents of urban areas, especially those in poorer neighbourhoods, often keep animals to support their food security and income (FAO, 2001). In spite of many regulations to limit this kind of animal keeping, it is common to see animals grazing at the roadside or at the backyard in most smaller and major cities in developing countries. Most of these animals are kept in a low-input and diversified system.

Risks to human health

In diversified husbandry, because of the close contact between animals and humans, there is a special danger of infection from disease and zoonotic parasites (WHO, 2005). This phenomenon has a direct relationship with the conditions of poverty and lack of hygiene, as in the case of some serious and common zoonoses, such as cysticercosis, rabies, tuberculosis and (in South America) Chagas disease (Box 6.1). In addition, raising animals close to or inside the house attracts numerous undesirable insects and rodents, such as flies, mosquitoes and rats.

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