

Chapter 9

Livestock and Women's Livelihoods

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Abstract Livestock make substantial contributions to the livelihoods of poor women in Sub-Saharan Africa and South Asia, yet the factors that enhance or constrain livestock-related opportunities for women have received relatively little empirical analysis. This review applies a gender lens to a conceptual framework for understanding the role of livestock in pathways out of poverty, using a livelihoods approach that centralizes the importance of assets, markets, and other institutions. The three hypothesized livestock pathways out of poverty are (1) securing

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current and future assets, (2) sustaining and improving the productivity of agricultural systems in which livestock are important, and (3) facilitating greater participation of the poor in livestock-related markets. While these three pathways are distinct, with each requiring particular strategies and interventions to be successful, they are not mutually exclusive. The chapter summarizes what is known for each pathway and what these pathways imply for programmatic and policy interventions.

Keywords Gender • Livestock • Livelihoods • Assets • Markets

9.1 Introduction

After several years of relative neglect, the importance of livestock for livelihoods and poverty alleviation is once again being recognized. However, there is also an increasing awareness that certain types of livestock systems are associated with nontrivial consequences such as environmental degradation, greenhouse gas emissions, zoonotic and emerging infectious disease, or food-borne illnesses. There is a need to balance these positive and negative aspects as is made clear by the title of the State of Food and Agriculture 2009 report, “Livestock in the Balance” (FAO 2009). Attention to gender will be central to achieving this balance. Livestock are important in women’s livelihoods and asset portfolios. Women do much of the work in livestock systems, whether they own the animals or not; women are differentially exposed to health risks associated with animal production and food processing.

Although two-thirds of the world’s 600 million poor livestock keepers are rural women (Thornton et al. 2003), knowledge gaps still exist about rural women’s roles in livestock keeping and the opportunities livestock-related interventions could offer them. This is in contrast to considerable research on the roles of women in small-scale crop farming, where the importance of women is widely recognized and lessons are emerging about how best to reach and support women through interventions and policies (e.g., Quisumbing and Pandolfelli 2010; Gladwin et al. 2001). In the 2000s, some researchers have begun to provide evidence of relations between gender and livestock production (e.g., Bravo-Baumann 2000; Deshingkar et al. 2008; Herath 2007; Flintan 2008) but, as this review demonstrates, there remains a dearth of quantitative information on this subject, especially for the mixed crop-livestock systems where most livestock and livestock keepers are found and where the major increases in production will have to occur if the global demand for meat, milk, and other animal products in coming decades is to be met (Herrero et al. 2010). Furthermore, the multiple roles livestock play in livelihoods of the poor make generalizing about women’s roles in, and economic contributions to, livestock development problematic, and prioritizing livestock research and interventions for women’s development challenging (Niamir-Fuller 1994; LID 2004; Rangnekar 1998; Aklilu et al. 2008; Waters-Bayer and Letty 2010).

9.2 Conceptual Framework

This review applies a gender lens to a conceptual framework for understanding the role of livestock in pathways out of poverty (henceforth “livestock pathways out of poverty”) developed by the International Livestock Research Institute (ILRI 2002). This framework takes a “livelihoods approach” that centralizes the importance of assets, markets, and other institutions. The framework has been used to explore different aspects of small-scale livestock production and marketing, such as the impacts of livestock and animal diseases on poverty and poverty dynamics (Kristjanson et al. 2004; Perry and Grace 2009). This is the first time the framework has been used to investigate gender issues.

The three hypothesized livestock pathways out of poverty are (1) securing current and future assets, (2) sustaining and improving the productivity of agricultural systems in which livestock are important, and (3) facilitating greater participation of the poor in livestock-related markets. While these three pathways are distinct, with each requiring particular strategies and interventions to be successful, they are not mutually exclusive. In any particular circumstance, one of these pathways may offer more opportunity than the others for reducing poverty, but livestock keepers, researchers, and developers alike must pay attention to all three pathways if they hope to sustain and optimize development of livestock-based enterprises.

Pathway 1—Helping women secure, build, and safeguard their assets. Recent research on livelihoods and poverty dynamics recognizes the importance of assets to the poor (Carter and Barrett 2006), and in particular, livestock assets to the poor (Kristjanson et al. 2007; Little et al. 2008). While poverty is often measured in terms of income or food security, a household’s ability to meet its material needs is determined largely by its assets—the physical, human, social, financial, and natural kinds of capital that determine what livelihood strategies a household can pursue and how well it can cope with risks and shocks (Sparr and Moser 2007; also see Meinzen-Dick et al. Chap. 5). Beyond material wealth, assets provide the basis of agency, or the “power to act, to reproduce, challenge or change the rules that govern the control, use, and transformation of resources” (Sen 1997).

As discussed in other parts of this volume, research on intrahousehold dynamics has shown that interventions that increase women’s access to, and control over, assets have been shown to improve household food security and child nutrition and education as well as the well-being of women themselves (Quisumbing 2003; Smith et al. 2003; World Bank 2001). An implication of this research is that development interventions designed to reduce poverty should pay attention to how households accumulate—as well as lose—access to assets. Livestock are an important asset for women because it is often easier for many women in developing countries to acquire livestock assets, whether through inheritance, markets, or collective action processes, than it is for them to purchase land or other physical assets or to control other financial assets (Rubin et al. 2010). However, the relative informality of livestock property rights can be a double-edged sword for women when their ownership of animals is challenged. Interventions that increase women’s access and rights to

livestock, and then safeguard their stock from theft or untimely death, could help women move along a pathway out of poverty.

Pathway 2—Helping women increase and sustain their livestock productivity. Improvements in the productivity of livestock systems can come in the form of increased outputs of milk, meat, eggs, and surplus animal stock, but such improvements may also take the form of reduced environmental degradation (e.g., less pollution of water sources by livestock excrement) or more efficient use of natural resources (e.g., of water used to grow fodder crops) or lower health risks associated with keeping livestock (e.g., brucellosis). While measuring the productivity of small-scale livestock systems is not straightforward, in part due to the multitude of economic and social roles livestock play in livelihoods, it is generally believed that there is considerable scope for improving the productivity of most small-scale livestock systems in the developing world (FAO 2009; Staal et al. 2009).

The three conventional pillars for improving small-scale livestock productivity lie in improving animal feeds, breeds, and health. Other avenues being explored to improve productivity of livestock systems include improving crop-livestock interactions on mixed smallholder farms, livestock water productivity, carbon sequestration on rangelands, and efficiency of farm animal labor. Despite relatively lower investment by the public sector in livestock research, many technologies exist that appear to be appropriate for smallholder systems, yet adoption rates remain low (FAO 2009). Overcoming problems of appropriateness and access to existing technologies and/or developing new ones could have significant benefits in terms of increased productivity—for sale or for home consumption in the form of nutritious animal-source foods—and in reducing negative environmental and health impacts.

Since both productivity and environmental improvements arise from changes in the way people manage (feed, water, treat, herd, care for) livestock, it is important to understand how these decisions are made, and what factors promote or constrain adoption of new, more efficient technologies and practices. Men and women often manage different types of animals and are responsible for different aspects of animal care. Women and men also typically have different objectives for keeping animals, different authorities and responsibilities regarding animal management, and different abilities to access and use new information and improved technologies. These differences may lead them to have different priorities regarding investments in the adoption of new technologies and practices. To have impact, research and development organizations may need to take these differences into consideration in the types of technologies developed, and the manner in which they are refined, disseminated, and supported.

Pathway 3—Helping women participate in and benefit from livestock markets. The increasing global demand for animal products has been dubbed the “livestock revolution” (Delgado et al. 1999). This demand is expected to provide incentive for adoption of productivity-enhancing technologies and practices for those producers who have access to markets for sales of milk, meat, or eggs. This rising demand could also generate increased employment opportunities along the entire livestock value chain. Because livestock market chains are long and complex, in

theory they provide myriad opportunities for the poor to participate in, for example, through the provision of livestock inputs and services or the marketing and processing of livestock products.

Women tend to face more challenges than men in accessing and benefiting from markets, especially more formal markets (see Rubin and Manfre Chap. 12 and Hill and Vigneri Chap. 13). In particular, the indirect consequences for women of “gender-neutral” market development projects need to be carefully examined: where women have insecure rights over livestock or limited control over livestock products and income from their sales, they may have difficulty maintaining control, as livestock become more economically attractive to men.

Poor livestock keepers worldwide face a daily trade-off between selling their (relatively expensive) milk, meat, and eggs to increase their household income and consuming the same (high-quality) foods to increase their household nutrition. Because animal-source foods are so dense in nutrients, including micronutrients that help prevent “hidden hunger,” decisions in these matters have potentially large implications for the nutritional as well as economic health of households. Given women’s traditional responsibility for household food security, their level of control over decisions about whether to sell or consume the family’s animal products, as well as over how to use any income obtained from the sale of animal foods, could greatly determine the nutritional well-being of household members (also see Harris Chap. 11).

9.3 Helping Women Build and Safeguard Their Assets

9.3.1 Women’s Ownership of Livestock and the Importance of Livestock Assets to Women

Evidence from many different developing countries and covering many different small-scale livestock and agricultural production systems and livestock species reveals that poor women can and do own livestock. A common perception is that women are more likely to own small stock, such as chickens, sheep, and goats, than larger animals, such as cattle, water buffaloes, and camels. While often the case, studies show that the type of species owned by women varies by region and culture and can be dynamic.

In Asia, for example, analysis of a project involving the Grameen Bank, which provided microcredit loans to women (Todd 1998), showed a clear investment trajectory, with the women given credit investing their new capital in poultry keeping and then moving to goats and eventually to milk cows. In India, Heffernan et al. (2003) found that, despite a common perception that only men own bullocks, they were of particular interest among landless women, who rented them to farmers. In pastoral areas of Ethiopia, a study documented women purchasing bulls (Rubin et al. 2010), while in mixed crop-livestock systems, men and women both own cattle, goats, and sheep, although men own more (Yisehak 2008). In pastoral

societies, women frequently own fewer animals than men; however, livestock assets are generally more equitably distributed between men and women than are other assets like land (Flintan 2010). In Uganda, Kenya, and Nigeria, most urban cattle farmers are women. And although women and men in East Africa were found to keep similar numbers of cattle, men in Nigeria own more than ten times as many cattle as women do (Randolph et al. 2007).

In Iraqi Kurdistan, 70 % of both female- and male-headed households own livestock, with female-headed households, on average, owning twice as many animals as male-headed households (Waite 2000). The value of livestock in the female-headed households is also considerably greater than that of livestock in the male-headed households. In this society, where women do not engage in paid labor or other alternative income-earning activities, the care of livestock has traditionally been regarded as a “female activity”. In Ethiopia, on the other hand, a study in the Western Shoa region found that women in female-headed households own fewer livestock than men and than women in male-headed households (Torkelsson and Tassew 2008).

Men and women are also likely to differ in the types of breeds they own within a given species, with men more likely to have improved animals than women in dairy areas of Kenya (EADD 2008). While a higher percentage of female-headed households than male-headed households own local cattle, the reverse was observed for (higher-yielding, genetically improved) exotic cattle, with 63 % of male-headed households owning exotic cattle compared to 49 % of female-headed households. These results are consistent with those from Rwanda, where 45 % of male-headed households owned exotic cattle compared to 32 % of female-headed households (EADD 2008). Results from the same study show that in Rwanda and Uganda, female-headed households also owned significantly fewer local cattle (at an average of 4.2 and 5.1 head per household, respectively) than did male-headed households (7.8 and 12.6).

Men and women may also differ in the types of rights they have to livestock. Rights can be divided into user rights, including resource access, rights to withdraw products, rights to exploit commercially, and decisionmaking rights, such as management, exclusion, or alienation (Meinzen-Dick et al. 2004). For example, in many cases, women control cattle milk when it is used for home consumption; however, they cannot sell it and keep the income (Valdivia 2001). Guèye (2000), in a review of backyard poultry in Africa, states that women generally own and care for poultry; however, they can seldom take sole decision over the use of the birds or eggs (consumption, selling, exchange, etc.). McPeak and Doss (2006) found that, among mobile pastoralists in northern Kenya, women had the right to sell milk; however, men were responsible for the overall herd and had the right to decide where the household would camp. If women’s marketing objectives conflicted with men’s herd management objectives, men used location to limit women’s ability to market. In some societies, women may “own” some animals (e.g., having brought them into the family upon marriage or later through inheritance) but have little say about selling or slaughtering them (e.g., among the Massai) (Talle 1988). Yet in other societies, e.g., among the Nandi (Oboler 1996), the women may have a say in sales

decisions, even though they do not “own” the animals. Flintan (2008) observed that in some pastoral societies, men cannot sell without approval of women and sometimes also children.

Heffernan et al. (2003) found sharp differences between the sexes in their perceptions of the roles of livestock in Kenya, where women viewed livestock primarily as a means of ensuring food security for the family, while men perceived livestock as a means of making longer-term investments. Rubin et al. (2010) found that livestock are the preferred investment for both men and women in microcredit schemes.

9.3.1.1 How Do Women Acquire Livestock?

Women acquire animals as gifts, they inherit them from family members, they receive them from development projects, and they buy them in markets. The literature indicates that women are more likely than men to acquire livestock through nonmarket rather than market channels; however, this is not always the case. For example, Rao et al. (2002) found in their study in India, that most landless women purchased milking cows out of their own savings coupled with the earnings of their husbands, or depended on moneylenders, or (in the case of Pondicherry) purchased cows through loans taken from the government or private agencies. Only very few (3 out of 57) had obtained the animals as a “family gift” (i.e., a nonmarket channel).

A recent study in Bolivia, India, and Kenya found that, when the data from Kenya were disaggregated by production system and agroecological zones, only a few female-headed but most male-headed pastoral households purchased their animals (Heffernan et al. 2003). Heffernan et al. concluded that women in Kenya appear more able than men to access informal networks to obtain livestock. In India, on the other hand, women had few informal or formal mechanisms for acquiring livestock, whereas men had both.

Zambian women said that they could not buy livestock because income from both livestock and crop agriculture, including their vegetable plots, was controlled by men (Chawatama et al. 2005). This concurs with more widespread evidence of the importance to developing-country women of informal mechanisms for obtaining livestock assets. It also suggests that the reason that these women do not buy more animals in the market is not that they cannot access markets, but rather that they have no cash with which to purchase animals. Removing this constraint, for example through microcredit, can result in more women buying livestock (Todd 1998; Rubin et al. 2010).

Livestock have been freely provided to women by organizations such as Heifer International, FARM-Africa, and Land O'Lakes for many years in many countries in Africa and Asia. In Bangladesh, the Self-Employed Women's Association and Rural Advancement Committees are examples of local initiatives that organize women in the informal economy and facilitate their access to productive resources such as livestock as well as critical services such as health, housing, and childcare. Past livestock development—especially emergency aid initiatives such as restocking—overlooked gendered access issues and, as a result, did not benefit or even had a

negative effect on women. Over time, these failures have been documented and lessons identified (Niamir-Fuller 1994; Heffernan et al. 2004), although they are still not always incorporated into programming.

While few rigorous evaluations have been conducted on the impacts of these more recent initiatives, anecdotal evidence of the benefits to women is positive and the projects have done much to bring attention to the value developing-country women place on livestock, and on building assets. For example, in 1998, Heifer International established a Women in Livestock Development (WiLD) initiative to help women use livestock to care for themselves, their families, their environments, and each other. A project is designated “WiLD” if 70 % or more of the participants in the project, including its leaders and decision makers, are women. WiLD projects provide women with cows, goats, water buffaloes, poultry, and other farm animals (Heifer International 2008).

9.3.1.2 Threats to Livestock Assets

Livestock kept by poor people in poor countries face many threats. The animals are typically raised in harsh environments where drought and theft are common, and commercial feed and veterinary services are beyond the means of most people. Women’s tolerance for risk may be different from men’s, either because they are inherently more risk averse (Rubin et al. 2010) or because they face more difficulties in rebuilding livestock assets that are lost. Preliminary results from an ongoing pilot project on index-based livestock insurance in northern Kenya found that women were more likely than men to purchase insurance for their animals (Mude 2010, personal communication).

Understanding risk preferences and ability to cope with shocks is likely to become more important in the face of increasing climate variability. Turner (1999) found that repeated droughts in Niger strengthened women’s control over livestock because they were able to invoke a cultural norm that made men responsible for household food security, with the result that men had to sell their livestock before women did. This led to a change in regional herd composition and an increase in women’s relative control. However, another study found that many women in the Sahel felt that they would lose traditional access to resources if competition for rangeland and other livestock resources increased due to increasing climatic vagaries (IFAD 2005).

Another way women lose access to livestock assets is through the dissolution of households, either through divorce or death of a spouse (Mutenje et al. 2008). In such situations, cultural norms often dictate that animals are transferred to other family members (Engl et al. 2000; Goe and Mack 2005; Kanyamurwa and Ampek 2007). While some developing countries have enacted legislation to protect women from loss of property upon the death of their husbands, these laws are rarely implemented, and most widows do not possess the resources to employ legal experts to help them protect their property. While legislation exists to prevent property/asset grabbing in many areas of northern Namibia, for example, it is still common

practice for a husband's family to take livestock and other resources from a widow and/or remaining children upon the husband's death (Engh et al. 2000).

Many NGO projects are now addressing this issue. In Zambia, a Heifer International project, through training people, raising awareness, and conducting negotiations at different levels, has enabled women not only to co-own livestock with their husbands, but also to continue their ownership of the animals after their husbands die, animals that otherwise would have been taken away from them by their husbands' relatives. In Thailand, where a high incidence of HIV/AIDS has led to the disintegration of many families, women heads of households are being provided with water buffaloes and training in their management to help the women not only to bring in the rice harvest, but also to generate cash incomes through renting out these valuable animals to other community members (Heifer International 2008).

9.4 Helping Women Increase and Sustain the Productivity of Livestock

Given the general lack of data on productivity of smallholder livestock systems, it is perhaps not surprising that we found few studies comparing productivity of livestock kept by men versus women. A study of an intensive dairy intervention in coastal Kenya found no significant differences in this respect; in fact, female-owned and operated farms performed better than male-owned and operated ones (Mullins et al. 1996). Studies from cropping systems show that, controlling for access to resource such as land and credit, productivity levels are similar between men and women (Alene et al. 2008; Njuki 2001; Smale and Heisey 1994). Perhaps the key issue is not whether the current low levels differ between men and women, but whether the opportunities and constraints to improving productivity differ between men and women, as such improvements are critical to realizing this pathway out of poverty.

The relationship between gender and livestock productivity is not straightforward. Poor men and women keep animals for multiple purposes, both productive (food security, income) and nonproductive (savings, insurance, culture). To the extent that nonproductive reasons predominate and productivity does not correlate highly with asset or cultural value, improving productivity may not be a priority.

Many interventions aimed at intensifying livestock production, such as shifting from grazing to stall-feeding or by keeping potentially higher-yielding but also more demanding breeds, increase the workload of women and girls, because the intensification lies in their traditional tasks (Okali and Sumberg 1985; Mullins et al. 1996; Wangui 2008). To the extent that improvements in productivity require additional labor from women that is not compensated, they may have less incentive to apply the new technology or practice. Helping women contribute to and benefit from improvements in livestock productivity requires careful attention not only to the size but also to the distribution of the costs and benefits associated with improved productivity, especially who benefits from improvements and who makes the investments (financial and time) in generating them.

9.4.1 Role of Women in Livestock Keeping

While there is great variability across systems and socioeconomic contexts, women generally play a major role in managing and caring for animals, even when they are not the owners. Flintan (2008) documents participation of women in every aspect of livestock management in different pastoral systems around the world. In intensive Asian livestock systems, more than three-quarters of livestock-related tasks are the responsibility of women (Niamer-Fuller 1994). Fully 90 % of Nepalese women are engaged in agricultural production (compared to 75 % of men) (Herath 2007).

Indian women play a significant role in livestock-keeping by providing labor; in poorer families, their contribution typically exceeds that of men (George and Nair 1990). In India's tribal, low-rainfall and semi-arid areas, much of the work of managing animals has been transferred to women because the men have left to find jobs elsewhere (a similar phenomena is seen in most of Africa).

In Sub-Saharan Africa, women's roles in crop and livestock production are strongly determined by gender and cultural norms. In Nigeria, Ayoade et al. (2009) report that women feed and manage vulnerable animals (calves, small ruminants, and sick, injured, and pregnant animals), clean barns, milk cows, and make butter and cheese, but are not involved in livestock marketing or managing livestock diseases. These trends are similar to what was found in the Ethiopian highlands, where women clean cowsheds; milk cows; look after calves and sick animals; cut the grass and supervise the feeding and grazing of cows; make dung cakes, butter, and cheese; and sell these products once or twice a week. Men, on the other hand, feed the oxen and take the animals for veterinary treatment when the need arises (Yisehak 2008). Njuki et al. (2004), in a study in central and eastern Kenya, found women were more engaged in feeding of cattle, while men were more involved in watering and disease management. The total time allocation to dairy-related work did not, however, differ significantly between men and women.

9.4.2 Women's Constraints on Technology Adoption

In spite of the central roles they play in small-scale livestock systems, women are severely limited in their ability to make decisions regarding livestock enterprises. In addition, they receive little outside support to help them make better decisions about those enterprises. The agricultural service and input-delivery systems are dominated by men and therefore difficult for women to access (Upadhyay 2005).

Access to land. Although land is not a prerequisite for keeping livestock (if feed can be purchased), grazing lands are key to livestock production in many areas and many traditionally communal grazing areas are being privatized. In agro-pastoral systems in Peru and Bolivia, taking animals to graze is the task mostly of female heads of households. Guillet (1992) documented the benefits of growing alfalfa in fallow fields, a feed resource gaining in importance in the Altiplano region.

The shift to alfalfa has reduced the fallow fields women may use for grazing their sheep or *criollo* cattle, especially those women in poorer households without access to land with appropriate soils for growing alfalfa (Valdivia 2001).

Group ranch, or “block grazing,” systems have been tried in various countries, including Kenya, Nigeria, Sierra Leone, Somalia, and Tanzania. In almost all cases, the planners failed to understand the fundamental importance of pastoral reciprocity and alliances in maintaining viable livestock production in ecologically fragile and climatically variable areas. In many regions, this failure led to range wars and a rush for privatization and expropriation of rangelands (Oxby 1987; Mwangi 2005), with particularly negative impacts on women, most of whom were not allowed to join the group ranches, and instead becoming unpaid workers taking care of their husbands’ livestock (Talle 1988; Kipuri 1989). With an increasing exodus of men from pastoral to urban areas in search of jobs, the women left behind could not influence decision-making and governance within the group ranches on such important matters as land use and ownership (Mwangi 2005).

Access to extension services, information, and training. A study in the Taurus Mountain villages in Turkey found that most women farmers had little access to information about animal production through public extension services (Budaka et al. 2005). Similar findings have been documented in Cameroon, Ghana, and Madagascar (Salman et al. 1999), in Pakistan (Teufel et al. 1998) and in The Gambia (Jaitner et al. 2001). The reasons given for this lack of access by women to livestock-related extension services included women’s long workdays, which precluded them from engaging with, or searching out, extension officers; a neglect of women’s needs and circumstances when targeting extension work; and widespread female illiteracy.

Among Maasai pastoralists in southern Kenya, women’s access to extension services was restricted by cultural as well as time constraints, with women typically relying on their husbands for information, although delivering extension messages through women’s groups was found to be effective (Kimani and Ngethe 2007). Zimbabwean women complained that cattle are generally registered in their husband’s names with the Department of Veterinary Services (for the purposes of dipping the animals in acaricides to prevent tick infestation), which serves to exclude the women from livestock initiatives (Chawatama et al. 2005).

Some countries have succeeded in increasing women’s access to livestock information and services. For instance, Indian women dairy farmers have been credited with raising the country’s milk production levels to among the highest in the world (Herath 2007). Women constitute 93 % of total employment in India’s dairy production (World Bank 2001). Starting some two decades ago, India recognized the importance of women in dairying and encouraged their growing participation in the country’s large dairy sector. Many dairy cooperative societies were formed across the country, including some specifically for, and run by, women in the states of Andhra Pradesh and Bihar (World Bank 2001).

India has also recruited and trained women extension workers, who are playing crucial roles in disseminating information and technologies. Since the late 1980s,

the country's National Dairy Development Board has made women's extension training central to their cooperative development program, which was designed to strengthen the role of women in the control and governance of dairy cooperatives. By 1998, 6,000 out of 7,000 dairy cooperative societies in India were women's societies (Patel 1998). Subsequent projects, such as the Women's Dairy Cooperative Leadership Program, have helped Indian women continue to gain more control over the sale of milk and the use of income from it.

Some of the governance-related lessons from India have been applied in other countries such as Tanzania, where the formation of district and regional networks of a self-help initiative proved an ideal platform for linking women dairy producers with the Tanzania Milk Producers' Association and the Tanzania Dairy Board.

In The Gambia, where the proportion of female agricultural extension workers has increased from 5 % in 1989 to more than 60 % today, more attention is being paid to women's livestock information needs and desire for female-led training, especially regarding small ruminant and poultry production (FAO 2003). Similarly, Due et al. (1997) found that in Tanzania, 40 % of women farmers preferred to work with female extension agents and 51 % of the women interviewed mentioned that they wanted to receive information on small ruminant production. Almost all the women (94 %) pointed out that they could attend demonstrations and training courses only if these were conducted in their villages.

Roy and Rangekar (2007) concluded that participatory and systems approaches applied to development of rural dairy business systems in Andhra Pradesh were particularly useful in understanding the perceptions of women producers, the constraints they faced, and the kinds of training most appropriate for them. An assessment of the impacts of a livestock training course in Kotli, India (Hussain et al. 2004) found that all the women who had received gender-sensitive training thereafter used their new knowledge, particularly regarding vaccination of animals.

Access to animal health services. A promising new trend benefiting women is the linking of public health and veterinary services. While traditionally working independently, the medical and veterinary sectors have recently come together to tackle zoonoses—diseases transmissible between animals and humans, particularly emerging zoonotic diseases such as highly pathogenic avian influenza. In Mongolia, researchers demonstrated that a proposed vaccination effort against brucellosis in livestock was profitable and cost-effective for both livestock and public health sectors (Roth et al. 2003).

Human and livestock health services often fail to serve the poorest livestock keepers, particularly in remote rural settings in Africa and Central Asia, because of financial, logistic, and service-delivery constraints (Heffernan and Misturelli 2008). However, in Chad, between 2000 and 2005, Schelling et al. (2007) demonstrated the feasibility of combining human and animal vaccination programs for nomadic pastoralists and their livestock. By sharing transport and equipment costs, medical doctors and veterinarians reduced their total costs. Joint delivery of human and animal health services is highly valued by hard-to-reach pastoralists. In intervention zones, for the first time, about 10 % of nomadic children were fully immunized annually

and more children and women were vaccinated daily in joint human-livestock vaccination rounds than in vaccination campaigns targeting only people.

The literature also points to a need to strengthen institutional links among agricultural research, agricultural extension, and veterinary services. An example of how this can be useful are routine vaccination systems for small ruminants established by agricultural extension services collaborating with veterinary services (Haenlein and Abdellatif 2004; Devendra and Chantalakhana 2002).

Strong producer organizations can also play an important role in efficiently delivering veterinary services to poor livestock-keepers. For example, the Kenya Women's Veterinary Association has partnered with the government to develop the country's semi-arid and arid areas through improvements in livestock-keeping. By building capacity in livestock and disease management skills in local communities, the association has helped improve control of zoonoses and reduce the incidence and costs of tick-borne diseases in cattle and Newcastle disease in poultry. An impact study in Kenya (Kimani and Ngethe 2007) reports that the formation of women's groups has helped improve control of livestock diseases, particularly transboundary diseases.

Several projects in East Africa are experimenting with training villagers, some women, to be animal health workers (also known as paravets, community animal health workers, or community animal first-aid workers) (Allport et al. 2005; Msoffe et al. 2010). An evaluation of the projects attributed their success to the participatory nature of their activities and to their ability to train independent local workers, who were effectively monitored and supported by government services (for medicines, vaccination campaigns, and referrals on serious cases). The evaluation also concluded that women were more heavily involved in the management of ruminants than was previously thought and that, consequently, their participation in the training program should be increased.

In many parts of the world, however, sociocultural barriers continue to hinder women's access to animal health services at the community level. For example, a CARE-led community animal health initiative found that women were generally not allowed to take part in training courses, although the women spent more time than did the men with the animals and were thus in a better position to recognize animal health problems earlier (Rivière-Cinnamond 2005).

Access to credit. Men in developing countries generally have greater and easier access to credit than do women, whose lack of collateral makes them appear not creditworthy (see Fletschner and Kenney, Chap. 8). Women dairy operators in Kenya, for example, typically lack secure titles to property, which prevents them from obtaining credit from formal financial institutions. A survey in Kenya, Rwanda, and Uganda showed that significantly more men than women had applied for loans from financial institutions or local cooperatives (EADD 2008).

In many countries, however, women have developed their own small credit systems. Credit funds and revolving savings women's groups are common throughout Africa. Members of a group each save a certain amount of money monthly, which is then granted in turn to each of the women as a loan, normally at no interest. Most of these

loans go toward non-income-earning activities (Place et al. 2004), although some groups allow loans of animals or milk for processing. These systems tend to function best at the village or neighborhood level, where tight social connections ensure that loans are repaid.

Women livestock-keepers have worked together to overcome credit constraints, as in India and Uganda, where they established group bank accounts so the women could access their dairy payments. In another case, a Danish-financed smallholder poultry development project demonstrated the important role that women's groups play in accessing credit in West Africa and Asia. This project took a holistic approach involving capacity building, organization of women into groups, and farmer field schools aimed at giving poor illiterate women farmers and local food vendors the knowledge required to benefit from collective action (Riise et al. 2008).

9.5 Helping Women Participate in and Benefit from Livestock Markets

The actors in livestock value chains include not only livestock producers but also input suppliers, traders, processors, wholesalers, and retailers. Helping women gain access to labor, product, and service markets all along the value chain, and improving their working conditions, can enhance their benefits from participation in livestock markets. While women may play many of these roles along the value chain in many regions, the literature mainly cites their roles as suppliers of livestock products, particularly milk products, and as processors of animal source foods, often street foods.

Women as suppliers of livestock products. Among the settled Fulani in Nigeria, women are responsible for all milk processing and marketing and for deciding on the quantity of milk to be sold or consumed by the family. Marketing is seen as both an economic and social activity. The revenue the women generated from their dairy products contributed substantially to their household incomes (Waters-Bayer 1985).

Among the Fulani societies in Ferlo, Senegal, milk production is entirely controlled by women, who also have sole control over the sale of any surplus (Dieye et al. 2005). There are also mini-dairies run by women who source their milk through contract farmers (Corniaux 2003). These small processors or pasteurizers generally operate with the support of NGOs or development agencies.

A study of evolving pastoral markets in northeastern Somalia (Nori 2008) documents the crucial role that women play in the commoditization of pastoral camel milk. When pastoral women can sell milk, it enhances local food security (Dietz et al. 2001). Market exchanges and related terms of trade are of particular importance during the dry season, when food production does not always suffice to satisfy the energy requirements of pastoral households. This is supported by other case studies, such as that in the Ogaden in Ethiopia's Somali Region—a traditionally food-insecure area—which shows that women's participation in the sale of

livestock milk products generates more than 80 % of the income needed to satisfy basic needs among pastoral households during the dry season (while it contributes about 40 % during the rainy season, when milk is in surplus) (Nori et al. 2006).

Physical, structural, and informational or organizational aspects of market access (Niamir-Fuller 1994) significantly affect women's ability to enter, engage in, and profit from livestock markets. Distances from villages to markets throughout Africa are often long, and milk is heavy to transport, particularly for women, who typically do not ride bicycles. The problem of long distances to markets is aggravated by structural problems—particularly inadequate roads and inefficient transport systems. Finally, lack of information can hinder women's access to and benefits from livestock marketing. In the Mandera triangle, at the intersection of the borders of Kenya, Ethiopia, and Somalia, Wabekbon Development Consultants (2009) cites lack of education and lack of access to accurate information and infrastructure as the most critical factors hindering women from selling milk and small ruminants.

In northern Kenya, Coppock et al. (2006) note that self-initiated groups convened and managed by women have managed to access livestock markets; they recommend that development initiatives facilitate more direct access by women to small local livestock markets or to cooperatives that could broker their livestock transactions so as to give women more control over the income generated.

Women as processors and retailers. Animal-source foods are among the most common street foods in most countries and often are derived from animals kept in cities (FAO/WHO 2005). In most African countries, most street-food processors and vendors are women (Canet and N'Diaye 1996). As much as 60 % of the milk sold in Dar es Salaam, Tanzania, is produced in and around the city (Canet and N'Diaye 1996).

In most cities in Pakistan, women provide the dairy needs from their urban and peri-urban plots. Similarly high levels of urban and peri-urban milk production are cited for Nairobi, Kenya, and Addis Ababa, Ethiopia. In South Africa, street food is probably the single largest informal sector employer (von Holy and Makhoane 2006). In Harare, around 9,000 people (81 % women) are involved in making and selling street food (Graffham et al. 2005).

A major concern about urban agriculture and informally marketed food is public health (Moy et al. 1997). The pathogens found in street food include *Escherichia coli*, *Staphylococcus aureus*, *Salmonella spp.*, and *Bacillus cereus*. Animal-source foods are the most common cause of diseases in urban areas. For example, in Zimbabwe, cooked meats posed the greatest health risk of all food sold on the street (Randolph et al. 2007). Zoonotic diseases, including most food-borne diseases, are both important and neglected in most developing countries (WHO 2006).

Authorities in many African countries have responded to this problem with weak and erratic implementation of legislation on street food and urban agriculture (Bryld 2003). As formal and informal standards grow, there is a real risk that the poor will be excluded from markets (Perry et al. 2005). Whereas food-safety/quality initiatives that have attempted to eliminate urban agriculture and informal food markets

have been viewed as gender insensitive (Nduna 1990), the literature also provides examples of food-safety regulations that benefit women livestock keepers.

Impacts of commercialization of milk on women. Studies conducted among the Fulani in Nigeria (Waters-Bayer 1985, 1988) demonstrated how the commercialization of milk has eroded women's traditional control over milk products, thereby decreasing their power within the household. The men are most interested in ensuring that enough of the daily milk produced by the household cows is left for the suckling calves that the men are raising for the beef market. The women, who fully control the dairy earnings, are more interested in selling as much milk and dairy products as they can to obtain cash. Thus a change in the division of labor, with men taking over the milking role, reduced women's access to milk and thus to dairy income, diminishing their ability to control the welfare of their households.

Evidence from East Africa shows that where and which milk is sold can determine whether women manage the milk income or not. Women have greater control over the evening milk than the morning milk and manage more income from milk sold at local markets and to neighbors and mobile traders than they do from milk sold to collection centers or chilling plants (EADD 2008). A survey of dairy households in Kenya, Rwanda, and Uganda showed that women received dairy income in 35 % of the households that sold milk to individual traders but in only 16 % of households that sold milk to collection centers (EADD 2008). Formalizing milk markets through member-based collection centers and cooperatives can thus lead to women losing their income from milk. Njuki et al. (2011) found that the higher the income from livestock or livestock products, the less likely women were to manage the income.

In a review of literature on the impact of commercialization on the role of labor in African pastoral societies, Sikana and Kerven (1991) note that, where live animal marketing has come to dominate, women's labor in pastoral production is devalued, since dairying is no longer emphasized. Likewise, where marketing has led pastoralists to shift from large to small stock (which can have a higher market value), women's role in managing small stock is diminished.

Nevertheless, it may be too simplistic to conclude that commercialization only erodes women's power. Where a strong market value for milk and/or dairy products is established, women's roles in dairying may be enhanced and their labor refocused on marketing rather than production. This latter effect is described by Micheal (1987, cited in Sikana and Kerven 1991) for Baggara pastoralists of Kordofan, Sudan, where over the previous 30 years there had been a growth of seasonal cheese factories dependent on purchasing milk from Baggara women. These factories are the main suppliers of cheese to Sudan's urban areas, while cash income from milk sales is estimated to comprise about a quarter of pastoral family income for the Baggara. Micheal notes that, although it is men who sell cattle and men recognize that milk is important for herd growth, the increasing urban demand for milk and milk products has meant that women's traditional role in controlling milk output from the herd has evolved into their control of milk marketing (see, also, Nori (2008) on milk marketing by Somali women).

9.5.1 What Kinds of Livestock Interventions Increase Women's Market Participation and Benefits?

There appears to be more awareness of the importance of gender in market-related livestock projects than in projects focused on raising livestock productivity (although whether this awareness translates into effective livestock marketing strategies for women is unclear). A Heifer International report on activities in East Africa found that women provided more labor in dairy enterprises than did men, but the level of women's control of the dairy income did not usually match their contribution, and this despite Heifer's finding of a strong correlation between women's control of dairy income and the productivity and success of dairy projects.

Women's groups initiated by development projects are widely used to support women pursuing urban agriculture; these groups provide women with microcredit schemes and other forms of support for their dairying, poultry production, livestock marketing, and food transformation and sale (Niamir-Fuller 1994; de Haan 2001). Joining such groups may be the only way for many poor women to obtain sufficient resources to start up and profitably operate a livestock-related enterprise. Membership in such groups enables women to more effectively lobby government departments and other decisionmaking agencies affecting their livelihoods. Although the performance of such women's groups has been reported as variable, group membership gives many developing-country women the freedom to participate in livestock development activities, enabling them to protect their interests, to overcome legal hurdles facing them, and to access the training and equipment they need to increase their production and sale of safe livestock foods.

In Bangladesh, the Bangladesh Rural Advancement Committee (BRAC) poultry model is an interesting example of a market-oriented intervention because, in order to achieve its goal of increasing income and nutrition of poorest women through poultry production, the model also supports a range of supply (parent stock, feeds, vaccines) and service (training, credit, extension) activities and involves women in all these areas (Dolberg 2001). Women who provide supplies receive support so they can continue to do so, on a commercial basis, to program and nonprogram participants. By 1999, BRAC was reaching more than 1.4 million women with this model, and it has been scaled out to other NGOs and to several African countries.

9.6 Summary and Conclusions

This chapter reviewed the evidence for three main livestock-related pathways out of poverty for women—securing, building, and safeguarding assets; increasing and sustaining livestock productivity; and enhancing participation in and benefits from livestock markets.

Securing livestock assets: With respect to assets, while there is widespread evidence of women owning livestock, their circumstances and the kinds of livestock they

keep vary considerably by region, culture, and even by household. Women's ownership can also change over time. The implication is that while it is important to be cognizant of existing ownership norms and patterns in the design of interventions, these should not be taken as given. They can change to the benefit or detriment to women, depending on how interventions are designed and implemented.

In many cases, women's ownership of stock does not correlate with their control over use of products or decisionmaking regarding management or sale. Although some women buy livestock in markets, many obtain animals through inheritance, gifts, and other informal mechanisms. The relatively informal means by which most developing-country women acquire livestock may help explain the limited rights women have over animals, if more informal means of acquisition are seen as conferring fewer rights to control than outright purchase. Interventions that secure women's rights to livestock—their own or those of their households in the event of dissolution—could be of great benefit to women. Other threats to livestock assets owned by women include their lack of access to complementary assets and to services for livestock health, production and marketing, and increased commercialization, particularly of milk and dairy enterprises. Reducing these threats will help make securing livestock assets a viable pathway out of poverty for women.

The review found relatively little information on the relative importance of livestock in women's current asset portfolios or on their preferences for livestock versus other assets. While animals are often among the few assets many developing-country women can own, the relative insecurity of their rights to these animals, coupled with the greater responsibility they may have for livestock-related tasks, could make them less desirable than other physical or financial assets. Addressing this gap should be a priority for research.

Increasing livestock productivity: When it comes to helping women increase the productivity of the livestock enterprises of themselves and their households, it is important to recognize the key roles women play in these enterprises. Women may have different production objectives than men. Interventions focused on areas for which women have responsibility (e.g., milking, tending young stock, poultry feeding) need to be targeted to women if they are to have an impact on how animals are managed, whether or not women are the "owners" of the animals in question. This implies that women need to be more involved in technology design and testing, and in dissemination processes.

Little information is available on the relative productivity of livestock enterprises managed by women versus men, although quite a lot is known about the constraints women face to accessing information, training, and improved technologies. Livestock-keeping women are disadvantaged by their lack of access to complementary assets, such as land for growing forages, and to livestock production inputs and services that could enhance their productivity. Greater access to livestock extension services seems to be especially important for women, with some examples of promising approaches targeting women being tried.

Through their close proximity to animals and their handling of animal products, women are in many cases differentially exposed to zoonotic diseases and

other livestock-related health concerns. Addressing these issues could improve the productivity of livestock systems and improve the well-being of women and their families. Relatively little information is available on the relationships between gender and the negative environmental impacts of livestock production. Women's responsibility for gathering feed may contribute to degradation of forests and watersheds. At the same time, women are also likely to suffer the impacts of degradation; for example, when contamination by livestock of a water source requires them to get water from more costly (in time or money) sources. Addressing this gap will be important in order to reduce the environmental footprint of livestock in ways that help rather than hurt women.

Enhancing participation in livestock markets: The scarce literature that exists on women and livestock markets indicates that developing-country women participate in livestock value chains mainly as suppliers of dairy products and as producers and sellers of processed animal-source foods in informal markets. Although increasing the participation of women in livestock markets and value chains clearly has the potential to improve welfare, the increasing commercialization of livestock markets presents women with risks as well as rewards. The literature cites many cases where women's control over livestock enterprises and incomes is diminished rather than maintained or enhanced with increasing commercialization. Women stand to benefit substantially from improvements in food safety, especially in informal markets, but are often inadvertently hurt by the unintended consequences of inappropriate policies and regulations. The conditions leading to these different outcomes need to be much better understood. While market-oriented livestock projects, perhaps more than productivity-focused projects, are increasingly recognizing the need to pay attention to gender, the challenge remains to identify strategies that help women enter into and benefit more from livestock markets.

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