The Gender and Social Dimensions to Livestock Keeping in South Asia:
Implications for Animal Health Interventions

Prepared for GALVmed
By Beth A. Miller, DVM
7 March 2011

GALVmed

Protecting Livestock – Saving Human Life

Acknowledgements and Disclaimer

Copyright Beth A. Miller, DVM.
Any views expressed, do not necessarily represent those of GALVmed. All photographs are copyright and courtesy of the following individuals/organisations,(to whom GALVmed expresses its thanks) and may not be reproduced:

Heifer China *page 11; pages: 24; 45*

Steve Sloan *pages 4; 8; 27; 35*

Anita Swarup
front cover; pages: 2; 7; 15; 19; 20; 31; 46

Contents

Acronyms

ADB	Asia Development Bank
AI	Artificial Insemination
AIHH	AIDS Affected House Holds
BRAC	Bangladesh Rural Advancement Committee
CBO	Community Based Organization
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
IFAD	International Fund for Agricultural Development
HDI	Human Development Index
NGO	Non Governmental Organization
PLWA	People Living With AIDS
PVO	Private voluntary organization
SA	South Asia
SSA	Sub Saharan Africa
TB	Tuberculosis
TG	Thrift Groups
VPH	Veterinary Public Health
WHH	Women Headed House Holds

Executive Summary

1 Importance of livestock to women

Livestock on small scale farms in South Asia are often managed by women, but technical training and inputs like vaccines are usually targeted to men only. This limits the health and productivity of the animals, and does not address women's low social status, and its drag on the entire economy. Gender mainstreaming of animal health care to benefit women and the animals they care for will raise their status and in turn improve food security and the welfare of the entire family and the community.

Raising the status of women in South Asia is both an economic and humanitarian imperative. Women receive less food, health care, education and respect than their male counterparts, and they pass these disadvantages on to the next generation through low birth weight and undernourished children. Son preference is so rampant that female feticide and girl child death from neglect result in "masculine," sex ratios of 94 females for every 100 males. The "South Asian Enigma," is the surprising increase in child malnutrition in the face of rising incomes, due to the low status of women, and their inability to control enough resources to feed them themselves and their children properly.

Livestock are central to the livelihoods of South Asian farmers, and animal health care can be a critical opportunity to call attention to the contribution of women, involve them in training and marketing, and ensure they share in the benefits of enhanced production.

2 Species preferences

Women in South Asia work with many species of livestock, including cattle, buffalo, yaks, small ruminants and poultry, and have access to some of their products, even when the husband is the formal owner. Poor families depend more on smaller animals such as sheep, goats or fowl and keep livestock for both cash and subsistence use such as food, fertilizer, savings or traction. Women in poor families spend more time caring for their family's livestock that the better off.

Women usually manage poultry with little interference, until the operations generate enough income to entice men to take over. Women may also have more autonomy in the management of small ruminants, because they are initially viewed as having little value. Women are expected to handle large ruminants like dairy cattle and buffalo, but income generated is usually taken by men.

Swine are not found in Muslim or Hindu areas, but are important in tribal areas and attract little public interest or investment. Women are the main caretakers of home based swine, so improvements in management and health care should target women.

3 The gender division of labor

The gender division of labor in South Asia usually assigns women the daily activities of livestock keeping for household based animals, such as feeding, cleaning, watering, milking and sometimes herding. They observe animals for signs of illness, and administer both traditional and modern medicine. However, men have more mobility and typically are responsible for breeding, and fodder production. They are more likely to interact with extension agents, animal health specialists and sellers of production supplies. However, information they receive about animal health is rarely shared effectively with the women who will use it.

Women are more vulnerable to zoonotic disease because of their increased daily exposure to livestock. In addition, they are responsible for sanitation and food preparation, the two main areas where disease can be prevented. When women become ill with zoonotic and other diseases, they are less likely to receive a diagnosis and treatment than men.

Variations in gender division of livestock tasks require that all field work begin with information on gender roles and responsibilities, so the correct information will get to the person who will actually use it, often the women. Gender roles are constantly changing, and the migration of men to cities for paid employment often leaves women with an increase in livestock keeping responsibilities.

The typical gender division of labor also assigns women the unpaid household tasks of cooking, cleaning, childbearing and rearing, and water and fuel collection. They may process products like milk for home use or market. Their heavy workload and time poverty is often the limiting factor in improved livestock production. Labor saving technology to reduce drudgery, such as biogas digesters or forage cutters could free up time for livestock production tasks. Women also need incentives such as cash, permission to travel, or simply acknowledgement of and respect for their work.

4 Constraints to accessing animal health care

Women's constraints across the region include illiteracy, lack of mobility, heavy workload, low confidence, poor health and less access than men to assets like land, cash, supplies, information, credit, and markets.

Although women are the daily caretakers of most livestock, their lack of education and mobility, and low status prevent them from accessing animal health care products and services. Women are more likely to be illiterate than men, especially in rural areas, which in turn prevents them from developing the confidence to ask questions or use written materials. When they request assistance from veterinarians or technicians, they are ignored. Many women are confined to their homes, so they cannot visit central livestock offices, attend training sessions or even purchase medicine for a sick animal. They have little income to invest, and even micro-loans given to them are appropriated by their men folk. In addition, the work day of a poor rural woman is longer than a man's, due to both agricultural work and domestic chores like child care, cooking, cleaning, and collecting water and fuel.

Age is also an important variable in South Asia, along with gender, and mothers-in-law often control the behavior and time use of young brides. Women can increase their influence in the household through the birth of sons, although widowhood can bring additional marginalization and vulnerability.

Research and extension has prioritized technology and outreach to wealthy men, so to improve the health of the livestock of the poor, social and gender data about final users must be collected and used to tailor products and services to meet their needs.

5 Constraints to accessing markets for animals and products

Women are less mobile than men, limiting their participation in markets, and their illiteracy, lack of experience and low confidence makes it hard for them to compete when they are present. There is social disapproval of women coming into public space, which may be viewed as masculine. Even when women can sell their products, their men folk take the income. Producers' unions may be restricted to men, as the formal owners of land and livestock, so women have little influence on prices or policies. Producers' groups that do not include women's concerns cannot advocate for policies or technology at the local or national level which will enable women to become more productive and healthier. Even when women sell their products, they often give their income to the male head of household, and do not receive enough pocket money or food to meet their needs.

6 Improving access to animal health services and markets for women and other marginalized groups

Working in groups with other women is one of the most important ways for women to access animal health care and markets. NGO's are often intermediaries bringing inputs to villages, and marketing their products. There is a huge need to formalize these groups, and integrate them into producers' organizations so they can have more influence on the price and policies governing the marketplace.

Women's groups organized around livestock production are good opportunities to address gender issues with both men and women, such as division of labor and benefits. Men often do not know the extent of women's workday, or their under nutrition, and women are raised to not complain. However, if the women raising animals do not have incentives to increase their efforts, production is not likely to improve. Gender workshops and farm management training for the head of household (senior men and women) to better understand the needs of all family members needs to take place within the animal health system.

NGO's and "social entrepreneurs," have developed models to reach poor women, but scaling up will require partnering with research institutions and universities, which need reform. Gender responsive research requires looking at women as end users of technology, and must include labor saving initiatives, and inclusive distribution and marketing of products. Institutions should improve the gender balance of their professional and management staff with recruitment and retention of women.

Extension and training in animal management requires that professionals think of women as farmers and not just unpaid labor for men. Training men in women's tasks such as feeding or sanitation is ineffective, and wastes time and money.

When the agricultural private sector starts to consider women as customers, they will discover a huge market. Women prefer to purchase from other women, close to home and with verbal instructions since many are illiterate. They also need to feel that the store is safe, friendly and clean.

New vaccines and animal medications will have a positive impact on women and their families when women directly receive training in improved livestock management, access to animal health services, access to markets, and incentives and rewards for increased production. Increased numbers of women staff in livestock extension, agrivet shops and on research teams can increase women-friendly technology and its implementation.

Additional strategies to reach women include joint activities with human health services, and partnerships with social welfare organizations. Increasing the number of women as members and leaders in producer organizations or coops takes intentional training of members, change of membership criteria and quotas.

National issues which especially impact women are property rights, informal market regulation and statistical assessment of women's labor and participation in the economy.

GALVmed can ensure that new animal vaccines and medicines benefit women through policies and practices that prioritize raising women's status, building board experience in gender and agriculture, and training and rewarding all staff and partners in gender mainstreaming.

7 Recommendations to GALVMed

1. Develop a Gender Strategy through a participatory process including management, staff, field offices, and partner organizations. Address institutional issues such as personnel policies, board appointments, project approval process and partner selection, as well as project issues such as staff orientation and training, planning, monitoring and evaluation.
2. Ensure a common understanding of and commitment to gender equity and women's empowerment for all staff and partners.
3. Designate one person to coordinate and harmonize gender related programming, training and assessment, with adequate authority, time and budget, although responsibility for gender integration must be shared by staff, partners and programs.
4. In addition to formal surveys, use informal data on intra-household division of labor and control of resources for monitoring the status of women. Analyze gender data in each activity location because of the differences among social groups.
5. Based on the literature review, and evidence of systematic marginalization of women and AIDS Affected Households from animal health care activities, assume a proactive strategy to reach them.
6. Bundle vaccine interventions into packages that include animal health training, marketing, credit and leadership training for women.
7. Prioritize vaccines and training for small ruminants and poultry which represent a greater share of women's assets and livelihoods.

Women's constraints from poor health, illiteracy, lack of mobility, low confidence, need for resources and invisibility can be addressed when development actors agree that the change is needed, and provide the leadership, vision and resources to make it happen. For GALVmed, this means policies, partnerships, training, accountability and advocacy that promote sustainable improvements in women's position and condition so they can access and benefit from new animal vaccines and medicines.

1 Introduction

Women provide most of the labor for livestock production in South Asia, but men receive the bulk of training, credit and income. A change in the design and delivery of training, services, inputs and incentives to include the women directly handling the animals and their products is necessary to achieve GALVmed's goal of sustainable livestock systems that will allow rural livestock farmers to identify and diagnose disease outbreaks, access vaccines and administer treatments (GALVmed 2011). This will involve intentional efforts to raise women's status, assets, incomes and decision-making in the home, community and nations of South Asia leading to other positive ripple effects such as increased economic growth, enhanced child nutrition and environmental protection.

Culture and gender norms are constantly changing, but not always predictably. People change their behavior in response to economic incentives, legal or social punishments, in imitation of respected role models, and due to their own experiences. Sustainable development is informed by incentives and disincentives to change the status quo to empower the powerless, which are the poor, the women, and the ethnic or socially excluded. Legal protection, leadership and role models from the top, and dialogue in villages and communities all help individuals and families embrace the benefits of women's empowerment.

Livestock are valued by rural people everywhere as a source of food and wealth. Therefore, livestock interventions are an ideal place to recognize women's current contribution to agricultural and economic productivity and design training and resources to benefit them (GODHAN 2010).

According to the Asian Development Bank (ADB 2003), 70% of rural women raise livestock. The poorest raise only poultry, while the wealthier have cows and large ruminants. Tribal, pastoralist and low caste populations also keep goats and sheep, especially in dry areas. Although men control the sale and cash from cattle and buffalo, women often raise small ruminants and poultry, and may be able to use the income generated.

Since women are the main daily caretakers of South Asian livestock, training them in nutrition, breeding, management and animal health will impact productivity more than training the male head of household (MHH), who is the legal owner. **Vaccination campaigns that generate publicity and interest are key opportunities to link information on management and markets, and introduce messages on the importance of cash, resources and respect for women livestock keepers**. Success in livestock and other enterprises result when women control more of the income, and have a decreased workload (Quisumbing 2004).

Why is raising women's status in South Asia so important to achieving development goals of improved human welfare? South Asia has the most significant gender inequalities in the world. An important indicator is sheer survival; while the worldwide ratio of women to men is 106:100, in this region it is only 94:100. Despite declining poverty, fewer females survive childhood, and the sex imbalance is increasing. Son preference also results in female feticide following ultrasound sex determination, so that fewer females are even born (IFAD 2010).

South Asia (SA), especially Bangladesh, India, and Nepal are low income and food deficit countries, and have low gender related development indicators. Child nutrition (stunting and food variety) closely correlate with women's empowerment in Bangladesh, when mobility, decision-making power, and attitudes towards verbal and physical abuse were used as indicators (Bhagowalia 2010). The low status of women in South Asian countries, compared to other countries and regions of similar economic development, is partly responsible for low birth weight and the excessively high levels of childhood undernutrition in the region (Svedberg 2007).

The persistence of malnutrition of children and women in the face of rising incomes has been called the "Asian Enigma." Just over 30% of Africa's children are underweight, but in South Asia it is over 50%, and although poverty is widespread in both areas purchasing power is almost identical. A key difference is the poor health and nutrition of mothers in SA, due to their low status within their families and communities (Ramalingaswami 2006).

Cultural expectations can determine whether food is shared equally among family members, and whether women have the resources to provide for their own health and their children... In Africa, it is accepted that the greatest obligation on a woman is to look after her husband's children by feeding them well, and visiting medical clinics when necessary. In South Asia, by contrast, society and tradition oblige a woman to make her husband and mother-in-law the central focus of her responsibilities. Also, men and boys are fed more and better quality food, and receive better medical care. In times of food scarcity, women limit their own intake first. It is a religious practice in many SA countries for women to fast to ensure the wellbeing of the rest of the family (Ramalingaswami 2005).

"The South Asian Enigma," is the persistence of malnutrition in the face of rising incomes, and is correlated with the low status of women.
Ramalingaswami 2005

Because family income alone is not a good indicator of individual well being, other indicators such as child nutrition and women's empowerment are necessary to measure the impact of GALVmed's new vaccines and animal health medicines.

Although there has been substantial improvement in their aggregated Human Development Indicators (HDI) and Gender Development Indicators (GDI) among the nations of South Asia, these do not **differentiate between urban and rural women**, which mask the persistence of high gender bias in rural areas. Although governments and donors recognize that rural gender inequality impedes economic and social progress, comprehensive policies to explicitly advance rural women's economic and social rights is weak and successful village level change is not commonplace (Balakrishnan 2005).

Women in South Asia are constrained by illiteracy, reduced mobility, low self-confidence, heavy workload and low status in patriarchal cultures. Women expect and accept domestic violence and poorer health than men in the same family or social group. Male migration to cities for paid employment has increased the percentage of women in rural areas, where poverty is mostly seen, contributing to the "feminization," of rural areas, and an increase in women's work load (Bhagowalia 2010).

South Asian women need access to assets like land, time, information, supplies, training, markets, credit and groups. Existing assets such as livestock, social capital, and indigenous knowledge need to be recognized, protected and enhanced. Because men are gatekeepers to resources for women, they must become sensitized to women's need for cash, training and time, and to share decision-making, and to learn how this will benefit their well-being as well (FAO 2011).

Women in South Asia are further constrained by the cultural practices of purdah, dowry, child marriage and childbearing, landlessness, caste discrimination and often an adversarial mother-in-law. Purdah and seclusion limit a woman's mobility, while the cultural practice of dowry, or transfer of wealth from a bride's family to a groom's family, lowers a woman's value since she is seen as an economic burden on her family.

The mother of a groom will often treat a new bride harshly, and can further limit her mobility and opportunities for livestock training. Therefore, outreach to mothers-in-law to engage their support for training and mobility of young brides is crucial. The power of the mother-in-law illustrates the importance of reaching across age lines as well as gender to reach the most vulnerable. The "social variables," of gender, age, class, religion and caste are reflected in an individual's opportunities in a given culture.

Gender analysis should always include the age variable because elderly women, elderly men, adult women, adult men, girl children and boy children each experience a difference mix of privileges and limits defined by each culture.

Women in South Asia face the additional constraints of purdah, dowry, landlessness, caste discrimination and an adversarial mother-in-law, in addition to illiteracy, overwork, and less access to information, training and markets than men.

Rural poverty in South Asia is closely connected with landlessness and caste. Landless and land-poor households make up over 50 per cent of rural households. The landless poor in India are mainly drawn from 'untouchable' or scheduled castes and tribes (Kabir, N. 2003). Landlessness is increasing across South Asia as population pressure reduces already small family farms, while mechanization limits rural employment even for the traditionally landless. Land alienation – the shift of land from the poorest to the rich within or outside the village – is increasing year by year, usually to pay off debts for marriages, medical care or festivals (Thomson, K. 2005).

Landless families depend more strongly on livestock for livelihoods compared to landed families which mix crops and animals. Women from landless families spend a greater portion of their workday caring for livestock, compared to landed families, so labor saving technology and increased access to resources is important. Landless families are more likely to keep poultry or small ruminants, while landed families may have cattle or buffalo (Heffernan 2003). Common property such as forests are increasingly privatized or protected, so women must search farther to find both fodder and firewood.

Women from landless families spend a greater portion of their workday caring for livestock, compared to landed families.
Heffernan, 2003

1.1 Overview of County Differences in Bhutan, Bangladesh, India, Nepal and Sri Lanka

South Asia covers a huge variety of ethnic groups, cultural practices, and geographic features, which impact the gender division of labor and decision-making in livestock keeping and marketing. The countries targeted for GALVMed's vaccine interventions illustrate this diversity, while underscoring the persistent disadvantage women face in all of SA, and the importance of a comprehensive gender strategy.

Bhutan is a small Himalayan country where women enjoy some of the most egalitarian legal protection and respect in the world. However, rural poverty is high, and women's access to services and resources to improve livestock productivity lags behind men.

Nepal is also a small Himalayan country but women are disadvantaged from birth, with extreme gender disparities in education, health, income and workload.

India is a huge country, where each ethnicity, caste and class has different but coexisting systems of livestock keeping and gender relations, from the relatively egalitarian Tamil Nadu to the strongly patriarchal north. Paradoxically, the increasing wealth of India has increased gender inequality in many ways, including larger dowry demands on a bride's family, with increased mistreatment of young brides if their families do not oblige. Private, multinational, non-governmental and local, state and national policies and practices to address gender disparities are piecemeal, and not found as often as in sub Saharan Africa.

Bangladesh shares many cultural characteristics with Hindu majority India, and although the influence of Islam implies women should have some Koranic property rights, it is not enforced. In addition, traditional brideprice has been shifting to dowry, resulting in girls becoming a financial burden to the family.

Sri Lanka shares a Hindu majority religion with India, but the high level of education brings women greater opportunities in the labor market and within the home. However, like other South Asian women, rural Sri Lankan women work with livestock, especially dairy animals, but rarely are in decision-making roles in producer groups or national organizations that influence agricultural policy.

1.2 Religion

Religion can be a determining factor in opportunities and constraints for both men and women, and the South Asian countries all include many ethnicities practicing different forms of Hinduism, Buddhism, Islam, Christianity and folk traditions. Hinduism is found in India, Nepal, Sri Lanka and parts of Bangladesh. It encourages compassion for all living things, so appreciation of animals is high. However, castes or minorities that consume meat or handle excrement are marginalized and have few resources. Most veterinarians and animal health professionals and officials are Brahmins or high castes that do not condone meat eating, so it is difficult to establish meat inspection, small ruminant or swine extension, and manure handling systems. Hindu tradition also extols the virtues of loyal and subordinate women, and resistance to women's mobility and decision making can be strong. Widows are severely marginalized and remarriage is discouraged, despite Ghandi's example. Widows remain poor and very vulnerable to rape and exploitation. Some observers have noted that the Hindu belief in reincarnation makes it more difficult to mobilize public opinion against present day oppression against women, Dalits and minorities since justice will come in future lives (Maarse 2011).

Buddhism is widely practiced in Nepal and Bhutan, and some sources speculate that the relatively high status of women in Bhutan is due to the country's Buddhist traditions and values, which view men and women as equals (SIGI 2009). In Nepal, Buddhist communities have a better record of educating girls as well as boys, although women remain disadvantaged compared to men. In Bhutan, local tradition and politics may offset egalitarian teachings, especially where the state provides support for Buddhist monks, while nuns are seen as a threat and placed under male control (BTN 2009).

Islam can be practiced in many different ways and linked with local customs that may help or harm women. Although women's property rights are enshrined in the Koran, local custom may force women to forgo claims in favor of brothers to maintain good family relations. Koranic modesty may be interpreted as a simple veil or complete seclusion from public areas including markets and organizations. Widow remarriage is encouraged, and women gain status with age and the birth of sons. Although polygamy is permitted in Islam, fewer than 10% of Bangladeshi men are in polygamous marriages. The Koranic injunction towards compassion and justice can help mobilize support for livelihoods for poor women.

Religious intolerance and fundamentalism are rising in South Asia, and leaders may reject change in women's status as influence from outsiders. A rise in women's public role is a challenge to those enjoying privilege. Cultures are changing all the time, however, and even nationalist movements are modern phenomena. In all communities, it will be important for local livestock interventions to have local religious and political supporters to facilitate reaching women farmers.

1.3 Definitions

1.3.1 Gender

Gender refers to the socially constructed behavioral norms and responsibilities for men and women, while sex is the biological difference between men and women. Gender norms, or the "normal expectations" for people's behavior, apply to a specific group in a specific time and place, and determine the range of actions that both women and men can take. Adherence to norms is monitored and assured by either the family or the peer group. Gender norms are changing all the time, and will vary from place to place, while sex is universal and unchanging no matter the society (Seebens 2010).

Gender roles are the behaviors and activities that children learn from parents and other social influences such as teachers, government, media, religion and the market. Many roles are internalized and accepted as "natural" but experience and external events can cause reflection on how changeable they are. Gender-specific roles and responsibilities are conditioned by household structure, access to resources, specific impacts of the global economy, and ecological conditions (FAO, 1997).

Gender gaps are differences in men and women's skills, resources or time that negatively impact productivity and welfare. Once gender gaps are identified, they can be addressed. For example, the gap in education limits women's ability to benefit from written materials about livestock disease, which can be addressed in the short term by training using pictures or songs, while the long term solution is more education for women and girls.

Gender Analysis examines the activities of both men and women to identify barriers to their productivity and welfare, and find solutions. Typical analytical categories are access and control of resources, and division of labor and benefits across gender and age groups (male elder, female elder, male adult, female adult, male child, female child).

Brief History of Gender in Development

Development interventions after World War II sometimes had unintentional harmful effects on women. Practitioners and donors assumed that poor nations could achieve prosperity by imitating rich industrial countries, and increases in national and family income would lead to improved human welfare. Western economists assumed that the family was the unit of development, and men earned income and women kept house, without recognizing women's contribution to economic production, or the value of non-cash services such as cooking, childbearing and rearing, or fuel collection.

The Danish economist Ester Boserup wrote "Women's Role in Economic Development" in 1970, and argued that women's invisible labor accounted for much agricultural productivity, and lack of resources for them constrained development. In 1988, Marilyn Waring argued in "If Women Counted" that women's labor was ignored because it was not included in most common economic indices, and therefore economic development projects which used their labor but rewarded their husbands worsened their condition. In the 1980's, "women's projects" or "gender projects" became popular because planners recognized that women had fewer resources and were needed for economic development. These income generating projects for women rarely succeed because the income accrued to the husband, and they did not address the underlying issue of men's control over women. Therefore, it is now recognized that the needs and preferences of both men and women must be part of all development activities.

Gender Mainstreaming is the set of practices to ensure resources and benefits to both men and women and requires detailed knowledge about current gender roles. However, Kristjanson (2010) found that interventions with positive impact on women were those that focused on women from the beginning, rather than simply adding women into existing project activities. Projects already designed around men's priorities are often inappropriate for women, so investment in institutional capacity for redesign, along with new activities, is often necessary.

Gender Training or workshops are activities for development professionals or grassroots groups to learn what gender is, how roles change, and how to identify and achieve positive changes for the future. The first step is gender sensitization, to allow both men and women to discover that current gender roles are changeable and not biological. Then men and women can analyze or reflect on the best type of gender relations for all members of the household, and how to achieve it in their homes and communities, organizations or offices.

Women's Empowerment

Many development projects have women's empowerment as an objective, meaning to raise their status so they can demand and receive rights, resources and some control over their own lives. There is no single definition of empowerment, but CARE uses the International Women's Empowerment Framework, which identifies three core dimensions of empowerment: agency, structure and social relations. CARE defines women's empowerment as the sum total of changes needed for a woman to realize her full human rights. Agency is her own aspirations and capabilities, structure is the environment that surrounds and conditions her choices, and relations are the power relations through which she negotiates her path. CARE policy requires that all interventions must demonstrate how they empower women at all three levels (CARE 2011).

Of course, women's empowerment does not happen in a vacuum, and is related to changes in the attitudes and behavior of both men and women. Therefore, any intervention relating to changes in women's status must include men also, so they can understand and support the process.

1.3.2 Dowry

The practice of dowry is the transfer of wealth from the bride's family to the groom's at the time of marriage. There is general agreement that dowry demands have become larger as cash needs increase in an increasingly competitive and market oriented economy. In Africa, brideprice is more typical, in which property is transferred from the man's to the woman's family, so that while sons are preferred, daughters are a source of wealth. In SA, since daughters are a financial burden, they may be aborted before birth, or receive less food or health care than their brothers. Governments have outlawed dowry but this has never been enforced (Kabeer 2003).

1.3.3 Purdah

Purdah is the separation of male and female space, and ranges from a veil covering a woman's face, to a physical curtain or barrier in a home, and defining public space as "male" and not appropriate for women. It is practiced by both Muslims and Hindus, especially in Northern India. Women in physical seclusion are restricted to the family homestead, including buildings, cow barn and garden, but excluding markets, government and social gatherings. In India, Nepal and Bangladesh there is increased status for the male head-of-household (MHH) when his women observe purdah. However, when poverty forces women to work outside the home and abandon purdah, women suffer the social disapproval, rather than the men. Even in areas that do not observe veiling, there is a strong disincentive for women to participate in public activities as this may be seen as "disrespectful." Generating income increases a woman's ability to feed her family, participate in decision-making and avoid domestic violence but may bring on social censure as well (Baden 1994).

1.3.4 Caste

Castes are the hereditary classes of Hindu society, distinguished by relative degrees of ritual purity or pollution and of social status. Castes are further divided into subcastes, which dictate occupation and behavior.

The highest castes are the Brahmins or priests, followed by the Ksatriyas or warriors, and Vaishyas or farmers and merchants. These 3 castes are called twice born and account for about 48% of Hindus. The rest are Shudras and Untouchables. The Shudras are "once born", and traditionally are not allowed to learn Sanskrit or study the Vedas, but work for the twice born. Below the Shudras are the Untouchables, who are literally "outcastes," and were regarded as "untouchable" because they are ritually polluting for caste Hindus. Caste restrictions and discrimination are practiced more widely in rural than urban areas (indhistory 2011).

Although Muslims and Christians in South Asia do not formally participate in the caste system, hierarchical behavior that may be caste based can be observed in traditional areas.

1.3.5 The family and intra-household dynamics

Class, religion, ethnicity and rural/urban location all influence the expression of gender roles and expectations in a society. Despite the diversity of South Asia, there are a few generalities. Most households include the extended monogamous family, with young brides going to live with their husbands' family, subjecting them to the authority of their husbands and mothers-in-law. The majority of marriages in SA are arranged, even among the educated. Among the poor, marriage of young girls to older men is common, and limits a girl's education as well as her health. In India, 50% of women are married before the age of 18, in Nepal it is 56%, and in Bangladesh is it 69%. A girl's age at marriage decreases as her family's poverty increases (ICRW 2011).

Women's influence in the family often depends on the power of their adult sons, so age is as important as gender in allocation of resources and decision-making. Urban people generally have greater opportunities for education, employment and political participation, so poverty is more common in rural areas, as are traditional practices such as caste and gender discrimination.

The head of household is usually the oldest male, and he makes decisions that impact the rest of the family. All earned cash is turned over to him, and in turns he gives pocket money to each member as he sees fit. Women are expected to defer to men, and younger men to defer to their elders.

Women can influence decisions in their households. Women's education, mobility and cash income are all correlated with increased sharing of decisions, labor and cash, and better health for them and their children (Quisumbing 2004).

1.3.6 Women headed households (WHH)

There are fewer WHH in South Asia compared to SSA, and are found mostly in urban areas. Although formal divorce is rare, men may abandon their wives, especially after leaving for work in cities, leaving the women "de facto" household heads, and responsible for earning income, feeding children and protecting the family. Most abandoned women still live under the authority of a man, either her husband's relatives or her own, but in a separate dwelling on the main compound.

There is a huge social stigma for women living alone, so abandoned women try to hide the situation. Widows are even more unfortunate because the Hindu custom of forbidding a widow from wearing jewelry marks her instantly, and she is given little respect.

In Bangladesh, poor women without husbands have few resources and feel they owe their survival to the largesse of others. Even if self-employed, they may be economically dependent on men who sell their products, since their mobility is limited. They are also more subject to physical insecurity and violence. When women heads-of-households are given housing in extended family compounds, they are given the least desirable, least durable and least central hut in the courtyard (Alam 1985). The presence of single women creates tensions when families feel obliged to support them but do not wish to, so these women try to be invisible (Baden 1994).

1.3.7 AIDS Affected Households (AAHH)

AAHHs are among the poorest and most marginalized in South Asia. Although the epidemic may not be as widespread as in SSA, or even the Mekong Delta, the number of People Living With AIDS (PLWA) in South Asia is increasing.

The epidemic affects men and women, as well as the rural and the urban, in different ways. In India, women account for 40 per cent of the total infections. In urban areas, sex workers are most affected, while in rural areas wives tend to be infected by husbands. Husbands and other family members with AIDS add to the demands on rural women who support them and supply nursing care. Attrition of family members from AIDS increases women's work burden and depletes family resources (Ramakrishnan 2005).

AIDS is a source of great shame in South Asia, and people avoid talking about it. Testing and reporting are rare, so it is difficult to know the extent of the disease and its impact.

In India, approximately 2.5 million people were estimated to be living with HIV in 2006, with national adult HIV prevalence of 0.36%. Yet in terms of individuals infected, India is home to the third largest number of people living with HIV in the world (UNAIDS 2007).

In South Asia, the vast majority of HIV infections occur through sexual transmission (85.6 per cent), mainly as a result of unprotected sex between sex workers and their clients, and their respective infection of other sex partners (Kumar 2005). Other high risk groups are injecting drug users, sex workers, truck drivers, migrant workers, and men who have sex with men (UNICEF 2011).

Small livestock such as goats and poultry are key livelihood resources for AAHH, because ill patients need high quality protein foods, and surplus can be sold for cash for medicine and other food. These households are often more marginalized from animal health inputs and advice, so intentional outreach to them can improve outcomes for the entire family (FAO 2005).

1.4 Gender and Zoonotic Diseases

Zoonoses are human diseases of animal origin. Owing to their close proximity to animals and their handling of raw animal products, women are often more exposed to zoonotic diseases, and when sickened, do not receive the same level of care as male members of the family (Kristjanson 2010).

Veterinary Public Health (VPH) protects human health through improved health of animals. Although it is part of a country's Public Health infrastructure, it is usually weak in developing countries. Reliable data on human zoonotic disease prevalence is often lacking, and there is even less good data on animal disease. Few sick animals see veterinarians, testing may be unavailable, and officials are discouraged from reporting because high incidence of disease can lead to negative performance reviews (Maarse 2011).

GALVmed's vaccination initiatives are good opportunities to strengthen VPH, through improved disease monitoring, prevention and especially educational campaigns. VPH data collection programs must reach out to women since they know more about the health of the animals in their care than the male owner. Education programs are usually conducted by male specialists for male livestock owners, but critical information is not getting to the people who will actually use it, the women.

Some zoonoses are transmitted to humans through food, like brucellosis, and tuberculosis (TB), so training the women who prepare the food is essential. Other diseases can be controlled through sanitation, such as echinococcosis/hydatidosis, which is women's domain. Vectors such as insects and ticks transmit other diseases between humans and livestock, and again sanitation is the best prevention. Women are needed to recognize, prevent and treat these diseases because they spend so much more time with animals.

There is a growing concern over animals as sources of disease: around 60 per cent of all diseases are zoonotic (Taylor 2001), animal source foods are the single most common source of food poisoning, and most of the recent emerging diseases have jumped species from animal hosts. However, much of the animal-associated disease burden is preventable, treatable or controllable (Perry 2009), but women's active participation will be essential.

"Bird Flu," has received the most media attention since its appearance in 2003, but other less publicized diseases like Newcastle in poultry, and brucellosis, anthrax and tuberculosis probably cause more human and animal losses...

Highly pathogenic avian influenza (or avian flu, caused by the H5N1 virus) has killed birds, people and destroyed livelihoods. While concentrated in South East Asia, it is endemic in Bangladesh and West Bengal, India and outbreaks have occurred around the world. The potential for a pandemic still exists, and increased surveillance of all livestock disease is the only positive outcome so far. While all producers were affected by the epidemic, smallholder commercial poultry keepers (batches of 500 – 5000) experienced the most severe livelihood losses (SAPPLPP 2011).

Poor rural women were among most vulnerable because they had few other assets, less access to information, and by living in close quarters with the birds, most exposed to risk of human disease (Hancock 2009).

Women, children and ethnic minorities, especially those living in remote areas with restricted access to services, are most at risk of all infectious disease, including zoonoses. In general, women are more exposed to communicable diseases than are men – and suffer more in terms of both illness and death. Women also face additional barriers to seeking and receiving, treatment. The consequences of stigma attached to many neglected tropical diseases, especially TB, are often more severe for women within their families and wider society (WHO 2009).

WHO notes that socioeconomic factors have an impact on TB control efforts, especially for women, who suffer from disproportionate poverty, low social status, less education (which impedes seeking diagnosis), and barriers to health care. Women may find it more difficult to comply with treatment once symptoms subside (Weiss 2008). Married women with tuberculosis in rural Pakistan, expect to be treated badly by their in-laws and to be expelled from the house. More females than males feared social isolation and rejection (Agboatwalla, 2002).

Risk of zoonotic disease is influenced by social variables such as gender, age, class, caste, religion and ethnicity, which can determine one's activities and resources. For example, in India human faeces is collected by the Dalits. They depend on this work because few employment opportunities exist for them, and also feed the waste to pigs as a livelihood strategy. However, handling of pigs and manure and consuming pork increases their risk of porcine cysticercosis.

People Living With AIDS (PLWA) are especially susceptible to opportunistic zoonotic diseases, such as cryptosporidiosis, which is not generally a problem for healthy individuals. Co-infection with TB is increasingly common. Therefore, AAHH need more education and resources to prevent zoonotic infection (FAO 2005).

1.5 Livestock Production Systems

Traditional livestock production systems are classified into "pastoral," "agro-pastoral," and "mixed farming," based on the household's dependency on livestock to meet their needs. In an agro-pastoral system, livestock account for between 50 and 80 percent of the total income, whereas a pastoral system, livestock account for over 80 percent (FAO 2003).

Pastoralism involves the movement of herds of animals to different pastures to ensure adequate grazing, and is practiced in dry or harsh environments. In many South Asian countries, pastoralist women stay behind in a fixed camp for longer periods while men physically move the animals. In Bhutan, it is often the women who move with the herds of yak. Agro-pastoralism is a mixture of pastoralism and settled agriculture, and mixed farming is settled agriculture that includes livestock. Mixed farming is only possible when rainfall or irrigation is available year round. It is an extremely sustainable system when livestock consume crop residues as well as pasture, and their manure is returned to the soil as fertilizer. Traditional livestock systems are considered low input and low output, and by modern industrial standards are considered inefficient, but they provide non-cash benefits like security, banking, fertilizer, food, status and gifts to build social capital that are not captured in most economic analyses (FAO 2003).

Poultry and dairy production are increasingly market oriented on small scale farms, and confinement or semi-confinement permits larger numbers of animals to be raised on smaller plots of land. Women's labor is increased because they are responsible for bringing water and food to confined animals, and removing the manure, but do not necessarily control any of the income from the increased production.

Modern industrial livestock production is a capital intense system that produces large volumes of milk, meat and eggs at a relatively low cost to the consumer. However, it generates little employment compared to traditional systems, and high animal concentration produces more waste than the environment can easily absorb. Industrial production is increasing in South Asia, and brings large profits to owners and safe products to urban consumers. Traditional and industrial systems operate in parallel in SA, yet policies, institutions and trained personnel favor the large scale operations (FAO 2003).

In order for GALVmed to ensure that its vaccines benefit the poor, they must make intentional efforts to find partners to reach women, who are marginalized from national livestock policies and practices. Greater vaccination coverage will also benefit large scale producers as disease reservoirs decrease.

Poor livestock keepers typically are small scale farmers, often landless or living in dry or low potential areas. This paper will identify strategies to reach small scale women farmers, with the assumption that better off women and men will also benefit, while the opposite is not necessarily true.

2.1 Country Gender Analyses: species, production and market characteristics

Across South Asia, cattle, buffalo, goats, sheep and poultry are important sources of income and subsistence. Yak herding is the only livelihood option for people living at high elevations, while small ruminant herding is common in hot dry areas. Sheep, goats and fowl are relatively more important to the livelihoods of the poor, while the better off have large ruminants.

Religion also influences the choice of livestock. Muslims and Hindus avoid pork, so swine production is discouraged in Bangladesh and India, and minorities that raise swine receive little support. Hinduism and Buddhism privilege a vegetarian diet, so there are relatively few resources for raising animals for meat, such as poultry and small ruminants, upon which the poor depend. This also makes it difficult to recruit trained staff to inspect meat at slaughterhouses, or to offer extension and services in tribal areas.

Swine are found in the tribal areas of NW India, which is ethnically and culturally akin to South East Asia and are amongst the poorest in India with a much higher proportion of the population below the poverty line (35%) than the national average (26%). Pig keeping is integral to their way of life. There is a growing demand for pork due to increasing per capita income, urbanization and changes in lifestyle and food habits. It is a small-scale backyard activity with 1-5 pigs per household. These low-external input enterprises depend upon family – mainly women's – labour and on other local inputs, particularly feed. In many parts of NE India there is virtually no veterinary service and generally a very low level of awareness among producers of pig diseases and preventative measures. A participatory study to improve animal health in this region concludes that women should be the main partners in animal health training programs (Wright 2010).

Labor for livestock production is typically divided by gender with women feeding, cleaning and milking animals, while men control marketing and keep the cash. Institutions delivering animal health care or training have a male bias, and direct resources to the male head of household. Public institutions such as Ministries of Agriculture acknowledge that targeting women with animal care training yields greater impact, but political will and adequate budgets have not been forthcoming. Non-governmental organizations, the private sector and for-profit cooperatives have developed some creative solutions to enhance women's benefits from livestock.

Women's constraints across the region include illiteracy, lack of mobility, heavy workload, low confidence, poor health and less access than men to assets like land, cash, supplies, information, credit, and markets

2.2 Bangladesh

Bangladesh is a highly patriarchal society. Within the household and through local decision-making and legal bodies (e.g. the shamaj and salish), men exercise control over women's labour, sexuality, marriage partner, their access to markets and their income and assets, and mediate their access to social, economic, political and legal institutions. Despite constitutional affirmations of sex equality, men have culturally sanctioned control over women, which is reinforced by pervasive gender-based violence (Kabeer 2003).

According to Baden (1994), in the past, upon marriage, women acquired assets such as livestock, but this is rarely the case now, with the shift from a pon (bridewealth) to a daabi (dowry) marriage system in some areas. This shift contributes to furthering the gap between rich and poor, since richer families often loan dowry money to poorer households and claim their assets on default.

Women are less educated than men, and in rural areas, girls are still kept at home more than boys, although urban girls are going to school in higher numbers (ABD 2010). Education in Bangladesh is strongly linked to women's control over their own earnings, and educated women appear less likely to suffer from domestic violence (Kabeer 2003).

Most rural families keep livestock, and women are responsible for most of the feeding, cleaning and milking for the cattle, sheep, goats and poultry, and other "indoor jobs," that do not involve leaving the homestead. Often women can control the income from backyard poultry and small ruminants, provided the amounts are too small to attract men's attention. Cocks kept for fighting are the domain of men, and they also sell milk and live cattle, and are responsible for livestock breeding (Banu 1987).

Non-governmental organizations have been at the forefront of social change to uplift women's status. Cultural attitudes and opportunities for women can vary regionally, so for example Mymensingh has a more conservative culture that has not been as receptive to social changed oriented NGO's as Saturia and Jessore. Women there have weaker control of resources, and husbands have greater reluctance for their wives to be involved in market production, which is regarded as a male domain. Men feel they lose status if their wives are seen there. One poor woman said, "The market is dominated by men, and women cannot talk with men." (Kumar 2010).

NGOs have organized extension and training programs in villages and shown that women's participation can be very high with proper planning and support. NGOs have likewise provided women with microfinance for purchasing livestock and equipment, and access to technical services even in villages not covered by government veterinary services (ADB 2003).

To address the difficulty women face in accessing productive resources, Bangladeshi NGO's and the private sector have pioneered "social entrepreneurship," or harnessing the power of the market to generate both income and social change. The Grameen Bank was founded by Bangladeshi economist Muhammad Yunus so that groups of poor women could use social capital or their mutual support instead of land as collateral for small loans (Grameen Bank 2011). In rural areas, women prioritize the purchase of goats and poultry as the best investments for their loan money, but losses can be high due to infectious disease and poor management.

"Social entrepreneurship," means harnessing the power of the market to generate both income and social change.

Grameen Bank 2011

CARE-Bangladesh is implementing the Strengthening the Dairy Value Chain (SDVC) project to target women specifically for training in dairy production and marketing, but found that husbands were the main obstacles to women learning and practicing new skills. For example, men did not give permission to attend training courses outside of their communities, and discouraged particular innovative cow rearing activities due to suspicion about their validity. Also men believed that women should not earn money. Therefore, CARE had to develop a protocol to deal with reluctant husbands, involving workshops and direct visits from staff and community leaders (Siddiquee 2010).

Another example of the pro-poor market oriented dairying model is the Grameen Motsho O Pashusampad (Fisheries and Livestock) Foundation, a non-profit organization, which added livestock activities to ongoing community development programmes. It provided training, vaccination, veterinary care and other support services to help poor women become dairy farmers, and assist others to improve and expand dairy operations. The Foundation then links the women dairy farmers to the for-profit Grameen Danone yoghurt plant (Morgan 2009).

Women also engage in small scale poultry production which can be very successful with the right support. The Bangladesh Rural Advancement Committee (BRAC) poultry model is a market-oriented intervention for increasing income and nutrition of the poorest women through poultry production. Often these women have more mobility than their better off sisters, but fewer productive resources. BRAC provides a range of supplies (parent stock, feeds, vaccines) and services like training and credit (Dolberg 2001). BRAC has farms to produce the chicks, and owns and operates its own poultry diagnostic lab. BRAC helps women organize into groups, developing their leadership to promote community development. They train both men and women on gender sensitization and gender analysis, at the grassroots, producer and national level (BRAC 2011). However, the farmers remain highly dependent on BRAC for external management of inputs and markets.

2.3 Bhutan

Women have equal legal status and are not subject to legal gender discrimination, but are less mobile than men, and less active in social and economic life outside of their own villages (IFAD 2007). Compared to women in most of South Asia, Bhutanese women enjoy relatively high status and legal protection.

Livestock are especially important in mountainous areas, and are frequently owned and managed by women. The government considers cattle the most economically important species, but yaks, horses, sheep, goats, swine, poultry and dogs are also kept. Although the livestock sector is increasingly commercialized, the value of most animals is from home consumption of milk, meat and fibre, and also includes draught power and manure to support crop production. Dairy products are sold during transhumance or yearly migrations near towns (Gyaltsen 2000).

The yak's tolerance to extreme cold makes it essential to livelihoods at higher elevations, which cover 30% of Bhutan. Yaks and cattle are closely related enough to share infectious diseases, and can also be crossbred, although this practice may dilute important genetic resources (Dorji, undated).

Gender division of access to and control of resources like land vary regionally. Government reports estimate that 60% of Bhutanese women own land (SIGI 2010).

In western and central Bhutan, land is usually inherited through the mother (matrilineal inheritance). Patrilineal inheritance dominates in the south, where polygamy has been common in the past, but is now officially discouraged. Poverty is deepest in the eastern zones, where 75 % of the poor live.

Northern Bhutan is one of the few places where polyandry persists, although officially illegal today. Polyandry, or the marriage of one woman to multiple men, usually brothers, was a social system to keep land in a single family. Unmarried women became a source of cheap paid labor for landowning families. Whether polyandry gave a woman more decision-making authority in her own family or simply increased her workload has been debated, but a woman's status and power generally rose with the increasingly power of her grown sons in the household (Rojas 1996).

Polyandry, or the marriage of one woman to multiple men, usually brothers, was a social system to keep land in a single family.

Rojas, 1994

Although Bhutan is more open to visitors than in the past, non-government reports are few and inconclusive about gender differences in livestock production, marketing, and decision-making. The rural population is much more impoverished compared to those in cities, and girls more likely than boys to be kept home from school to help with farm and livestock. Women have less contact with extension agents and buyers than men, and are kept home because of the heavy domestic and agricultural workload (BTN 2009).

Among the ethnic minority Layap people near the northern border with Tibet, the state provides education for children and adults, but about 90 percent of the adult learners are men learning business skills because they are considered the family providers. The women herd and milk the yaks and do almost all field work and collecting firewood. Men are dominant by tradition (Wangdi 2010).

Only about 30 percent of the students in the Laya school are girls. Most young girls tend to yaks in the high pasture land with their mothers and are away for most of the year. Sometimes the Bhutan Health staff travel out to the yak herds to follow up on girls' immunizations if a mother couldn't come to the Basic Health Unit (BHU) due to her yaks (Wangdi 2010). This suggests the potential for linking vaccination services for children and livestock in remote places.

2.4 India

Caste and gender are the defining features of life in India, and despite attempts by government to increase equality, being born female and low/no caste is to suffer double discrimination. Even as incomes rise from India's economic boom, caste and gender inequality persist.

Kabeer (2003) attributes the rise in gender inequality along with increased wealth to the "sanskritisation," effect, or Hindu mainstreaming. Across India, upward mobility and increased prosperity have led the poorest groups to adopt the dress and behavior of high caste groups, and to replace meat with milk in their diets.

In a few generations, they are accepted as Hindus, and suffer less caste oppression. Unfortunately, they also adopt forms of gender discrimination, such as purdah, resistance to widow remarriage, exogamy (a bride leaving her village and family to live with the husband's family), and a rise in the practice and value of dowry. Masculine sex ratios reflecting "missing women" have begun to spread to the lower castes and also the southern states (IFAD 2010).

Women have fewer educational opportunities than men, but education provides significant improvements in influence over household decision making, as well as protection from domestic violence (Kabeer 2003). Women who bring more assets into the household, either through dowry or earnings also increase their influence over decisions and are treated with more respect (Kumar 2010).

Across India, women are increasingly organizing themselves, through a diversity of non-government organizations (NGO's) and community based organizations (CBO's), and thrift groups (TG's) offering microcredit, training and marketing opportunities. Joining social groups can end women's isolation and dependence on the husband, and can build their confidence, which in turn helps them negotiate for more resources and decision-making in the home and community. However, not all women can join self-help and other groups, either from opposition from the family, lack of time, or inability to pay the joining fee (Kumar 2010).

In India, livestock on small scare farms provides both income and subsistence through food, draft power and manure for fertilizer or cooking. Despite regional and class differences, women and girls are usually involved in animal production, ranging from feeding, grazing, cleaning animal sheds to processing milk and livestock products. "Indoor" jobs like milking, feeding, and cleaning are done by women in 90% of families while management of male animals and fodder production are performed mostly by men (Narayanan1997). Caste can also determine division of labor, for example among some castes in Rajasthan, all dairy activities are completely in hands of males.

Caste or tribe can determine which type of livestock is raised, which impacts the activities of men and women. Higher castes keep large ruminants like cows or buffalo for dairy production, while poor, low caste or tribal people keep small ruminants, or even swine. Backyard poultry and increasingly small scale commercial poultry are managed by women, although men control the fighting birds (Heffernan 2003).

Livestock experts like extension agents consider women's work of caring, feeding, cleaning, observing and health care to be low skill activities, but they are critical to the survival, health and production of the livestock.

Ramdas 2000

In rural areas both landed and landless families depend on livestock production, and women were responsible for 60% to 90% of the work. In Ramdas' 1999 study in Orissa state, there were distinct differences depending on the geographical area, caste, community and type of livestock reared. Grazing responsibilities especially differed from region to region. The one activity in which women always played a prominent role was in backyard poultry rearing. In some areas, such as the semi-arid regions of Latur, Medak and Ratnagiri, men and women equally shared responsibilities like cleaning sheds and milking (Ghotge 2002).

Activities performed by men were occasional in nature, involve less time, energy, and labour and largely occur in the public domain, and included vaccinations, deworming, grazing, purchase of fodder and medicines, and taking animals to the dispensary. These activities involve greater mobility, access to new technology and information, greater interaction with the market and the outside world.

Among the pastoralist families,(Rabari-Bharwad), women managed their own animals, while the men were paid to look after other farmers' animals. Grazing was the only operation shared by the men and women (Ramdas 2000).

In the tribal communities in the Eastern Ghats, the work burden on women was considerably higher. Women carried out all of the management operations except in one village in Udaipur, where men mostly undertook activities such as milking, bringing in fodder and breeding. Watering, calving and the administration of medicine were shared activities. The cultivation and harvesting of fodder and other crops was also the men's job, although fodder cultivation is not common in these underdeveloped villages (Ghotge 2002).

Poor women sometimes keep livestock through a share system, which is one of the few ways they can generate income (Rangnekar 1992). A woman brings a client's animal to her home, and cares for it until it is sold, providing all of the food, medical care and labor, and the proceeds of the sale are shared with the owner at an agreed upon percentage. Since goats often produce twins, the offspring may be shared as well.

Efde (1988) found that distance to cities affect the gender division of labor. In the villages close to cities most men take on urban jobs, so that women take on the major burden of livestock rearing.

Women who work with animals on a daily basis have a great deal of practical knowledge, but would like the opportunity to learn more. In Ahmedabad district, Rangnekar(1999) found that the majority of women, except a few from remote tribal areas, were aware of the need for better-quality feed in order to achieve higher production, even though they may not have been able to describe it in terms of protein, energy, etc. Many of them knew that mahua flowers, oilcakes and grains are good-quality feed, and some even identified particular weeds, tree leaves and creepers as good-quality fodder for livestock. They were well aware of the specific habits and behaviour of each of the animals owned and how to feed and handle them accordingly. The women who supplied milk to cooperative societies knew something about clean milk, fat and solid non-fat content of milk, but quite a few had no knowledge of artificial insemination or crossbreeding since this work had not been initiated in some of the villages. Many of them were aware that vaccinations were administered, but very few realized their usefulness.

Traditional indigenous methods were still being used to treat ulcers after foot-and-mouth disease outbreaks, for tick control and for abscesses and diarrhea. In cases of difficult births, help was usually sought from local "specialists" who were mostly from traditional cattle-breeding communities (Bharwad/Gujjar). Most women were not aware of the importance of colostrum feeding. The majority knew that green fodder is of better quality than straw or dry grass and could differentiate between good- and bad-quality fodder.

Women from rich families were generally less knowledgeable. Many were not even aware of the milk yield of their cows and their animals and sheds were dirty, while those of the neighbouring poor families were much cleaner (Ghotge 2002).

Women from Dalit [untouchable] communities, traditionally employed by wealthy farmers to weed their fields, were extremely knowledgeable about grasses and weeds for fodder and about the management of small ruminants. Conversely, women from prosperous traditional landed agriculture castes, who have been involved in dairying, are very knowledgeable on pre-partum, post-partum care and calf management. Women were knowledgeable about simple household remedies, cures and medicines for treating small ruminants. Traditional healers were predominantly male, as knowledge was normally passed from fathers to sons and not to daughters. However, the aging healers have been agreeable to training female Community Animal Health Workers (CAHWs), especially if their own sons were uninterested (Ghotge 2002).

Despite all of the variations in work and income sharing, women's access to information and training in modern livestock management and dairying continues to be limited and even indirect, lowering their involvement and efficiency.

Bravo Baumann 2002

Dairy is one of the most important livestock activities in India, which is the largest milk producing country in the world (NDDB 2011). The milk of cattle, buffalo and goats has been used for food and income for centuries. Dairy has been a popular area for donor, government and private investment, to provide income for poor families, increase child nutrition and meet rising demand. Milk consumption is socially acceptable among Hindus that avoid meat, and therefore is an important source of high value nutrition.

In smallholder households, men usually market the milk and control the income, but there are variations as well. In pastoralist communities, milk is often sold by women, and in both low caste and pastoralist families, money from the sale of milk, animals or compost is kept by the woman. In the Ghachi community in Baroda district, income from animals remained in the hands of women only.

As commercialization of dairy increases, income tends to accumulate to the male head of household, while the workload on women increases.

Tores 2001

The National Dairy Development Board (NDDB) was established to streamline the production of milk in the country by organizing milk producers at the grassroots level into cooperatives. However, the membership in most of India's 70,000 village-level dairy **cooperative societies** (DCS) is heavily dominated by men, who own both the cows and the land, while women find their unpaid labor increases with commercialization. If women do not experience benefits from the dairy enterprise, they are unlikely to take interest in the work, and production increases are limited.

Increasing recognition of the central role of women in Indian dairy production, and their need to share in its benefits, led the NDDP in 1995 to initiate the **Women Dairy Cooperative Leadership Programme (WDCLP)**. Other interventions include organizing all Women's **Dairy Cooperative Societies (DCS)** and **women's thrift groups (WTG)**. WTGs mobilize the savings of the women members to facilitate loans for animal maintenance or for the purchase of new livestock. More important, the group acts as a secure place for saving the revenues from the sale of milk (Torres 2001).

The NDDB has tried to enhance women's leadership skills, and promote the thrift and credit groups through health, education and economic activities. It assumes that raising women's awareness of their rights and responsibilities as cooperative members will encourage their involvement in social and economic activities and coop leadership. However, the attitudes of the men are not directly addressed.

The dairy cooperatives are governed by boards, which set policy on price, membership, services and method of payment. Women constitute less than three per cent of total board members. By 2000, there were 2,476 all-woman DCS. Out of 9.2 million total members, only 1.63 million were women (18 %) (Bhatt 2000). It has been difficult to find data on the percentage of the budget that the National Board or the individual cooperatives spend on outreach to women, or the impact of their activities.

In a study of the informal milk market in Andhra Pradesh, 95% of the venders of fresh milk were men. Women vendors operated in markets that were within walking distance from their homes (e.g. Peddagollagudem) or were accessible by train or bus (e.g. Khammam and Vijayawada market). Most were from scheduled castes, but relatively well off economically (CALPI 2006).

BAIF India Research Foundation provides rural development services, including livestock and non-land based livelihoods and natural resource management (BAIF 2011). It has had a gender policy since 1995, although no gender disaggregated data is available. In 2010, they received funding to implement the GODHAN Project to pilot greater mainstreaming of gender considerations through dairy cattle expansion in three sites. A key strategy is training male extension personnel and other staff in gender sensitivity so they will accept women as legitimate farmers capable of learning. Before the project began, women stated that the male technicians would not return their calls or even talk to them (GODHAN 2010).

The GODHAN project has already started recruiting and training women to work as Artificial Insemination (AI) technicians, to increase the use of AI service by women managing dairy cows. The AI training program was restructured from one 45 day training, to several shorter periods which is easier for women. The trainees first had to learn to ride a motorbike, a new skill for Indian women. GODHAN has designed a special uniform for the female technicians to enhance their status and mark them as well trained professionals.

The GODHAN dairy project has also hired male and female staff at all levels to be available to farmers. The Cattle Improvement Centers are designed to appeal to women with attention to light, beauty and decorum. Chaff cutters will be introduced to reduce women's labor, and vehicles will be arranged to transport women to meetings, since they are not accustomed to traveling (GODHAN 2010). This five year pilot should help refine and scale up similar interventions to address women's actual situation.

Indian and other South Asian NGO's and institutions are learning that working on women's income generation is not enough to achieve increased decision-making or decreased workload, so they increasingly address attitudes and behaviors about men and women directly through gender training. They are also learning that outreach and benefits to women will be increasingly attractive to donors and partners.

Heifer International 2004

Poultry is another area where women can raise livestock with minimal interference from men, both for egg and meat (broiler size birds) production. It is not as well developed in India because of the Hindu attitudes towards meat consumption, but increasingly NGO's are promoting poultry as well as sheep and goats among the poor.

Small scale commercial poultry projects have been successful across India, and can be modifications of backyard scavenging operations (BRAC model) or small versions of industrial production, raising about 400 birds per batch. Typically NGO's organize women into groups, and supply feed, chicks, vaccinations, and pick up the birds for delivery to market The quality of the project often depends on the quality of the NGO's accountability system, and their commitment to social as well as economic development.

The NGO PRADAN has organized a cooperative of 459 women members (from tribal and dalit families) across 18 villages. Each member owns backyard production units of a minimum of 300-400 broiler birds and sells under the "Sukhtawa Chicken," Brand and through wholesalers. PRADAN recruited members who were already experienced with successful self-help groups, had one cent of land (435 sq ft), either owned or leased, to setup broiler rearing sheds. PRADAN supplied day-old chicks, which were ready for sale within a 32 day cycle. This allowed members to rear 7-8 batches a year and earn between Rs 45-80/- a day for approximately 200 days of yearly engagement. Other development partners provided funding or loans for sheds. Tribal women already have strong livestock keeping skills. In this project they keep the two systems alongside each other; i.e. the high tech broiler rearing and traditional backyard poultry based on indigenous birds for home consumption and cultural reasons. The broiler birds are not in contact with the indigenous poultry.

(Deka 2009)

2.5 Nepal

Nepal is a poor country with extreme geographic variation, from the Himalayan mountains to tropical lowlands. Especially in the mountains, communities are isolated and especially dependent on their livestock. Herath (2008) found that 90% of women in Nepal are engaged in agricultural production (compared to 75% of men), in addition to their domestic duties of cooking, cleaning, bearing and raising children, and collecting fuel and water. The most important livestock in Nepal are cattle, buffalo, goats, chickens, and at higher elevations, yaks. The national average per family livestock holding includes 3.8 cattle/buffalo, 2.2 goats and 4.5 poultry (AICC 2008).

Women contribute 70 per cent of the work in raising livestock and are also more knowledgeable than men about treating sick animals (Tulachan 1994). Paudel (2009) reports that Nepali women are mainly responsible for forage collection, cleaning the gutter and shed, and feeding animals, whereas milking animals and selling of milk was typically performed by men.

Men are the majority (75%) of the members in farmers' groups/organizations for cattle and buffalo. Less than 5% of higher positions were held by women. However, women were most often members in small ruminant and poultry producer groups, indicating greater interest and greater control over the smaller species (Paudel 2000).

In spite of women's active participation in care of all livestock species, extension, marketing, credit, and other activities critical to increasing livestock productivity and income are typically designed for and used by men. (HMG/ADB 1993).

Livestock research has not acknowledged that women's time limitations are also a limit on livestock production. Labor saving technology must be a priority for meaningful livestock and social development.

ICIMOD 1999

Government and donors have attempted to address gender disparities in rural Nepal, but men often appropriate resources. For example, women were less than 9% of the recipients of an animal health revolving fund program, because the program required a one month training course on animal husbandry and health-care, which proved impossible for women (CLDP 2005). Therefore, livestock interventions need to become more gender responsive.

2.6 Sri Lanka

Sustained public investments in health and education since the 1990's have led to impressive basic human development outcomes. Sri Lanka has universal primary school enrollment, gender parity in primary and secondary school enrollment, and universal provision of reproductive health services. Sri Lanka's poor tend to have better health and education outcomes than the poor in other South Asian countries (World Bank 2007).

Rural areas are home to nearly 80 percent of the population and about 88 percent of the poor in the country. Sri Lanka's persisting rural poverty results from poor agricultural policy coupled with the devolution of agricultural extension without any replacement, and weak infrastructure for drinking water and irrigation. A 20 year civil war and natural disasters have also contributed to ongoing poverty (World Bank 2007).

The post conflict areas are especially poor and food insecure. Thousands of children lost one or both parents during the 20-year civil conflict in the north and east of the country, and there was an increase in the number of households headed by women, which are more likely to be exposed to economic hardship. The non-conflict related rural poor are concentrated in the Central, Uva, Sabaragamuwa and Southern provinces (IFAD 2011).

While there is a high level of basic literacy among women, in practice traditional patriarchal attitudes limit the interaction of the vast majority of women in the public world of community decision making or commerce. Many women in rural areas have very basic levels of literacy and most women interviewed [for our study] noted they had never been to the local government office nor interacted directly with officials prior to their involvement in this project. Women commonly do not rise to high decision-making positions in either the public or the private sector (Thomas 2010).

The government has prioritized the dairy sector for public investment in the national economic development process. Cattle are the primary dairy animals, but buffalo and goats are also milked in high potential areas. The poultry sector is highly industrialized and offers scant rural employment (World Bank 2007).

Sri Lanka has a high number of female veterinarians and livestock technicians (Stephens, 1990), but since the 1990's, when government extension services were "devolved," to the provinces, services are mostly limited to the provincial capitals.

Smallholders provide the bulk of fluid milk, and mostly sell on the informal market. Women perform most of the dairy-related activities on the farm, while MHH often have off farm employment. Nearly 40 percent of the members of registered dairy cooperatives are women. However, they are rarely represented in the management or executive committees of these groups. Most Sri Lankan dairy farmers are not members of any cooperative, which are seen as corrupt, and they can sell their milk easily on the informal market (IFAD 2009)

2.7 Summary

2.7.1 Livestock Species

Women in South Asia work with all species of livestock, including cattle, buffalo, yaks, small ruminants and poultry, and have access to some of their products, even when the husband is the formal owner. Poor families tend to have smaller animals such as sheep, goats or fowl and keep livestock for both cash and subsistence use such as food or manure, which extension rarely addresses, and which government statistics undervalue.

Swine are not found in Muslim or Hindu areas, but are important in tribal areas and attract little public interest or investment. Improvements in current swine rearing practices can help lift their owners out of poverty.

2.7.2 Gender roles in livestock production

Although there is great regional, class, caste and ethnic variation, women generally perform the daily activities of livestock keeping for household based animals, such as feeding, cleaning, watering, milking and sometimes herding. They observe animals for signs of illness, and administer both traditional and modern medicine. However, men have more mobility and are typically are responsible for breeding, and fodder production. They are more likely to interact with extension agents, animal health specialists and sellers of production supplies.

Variations in gender division of livestock tasks require that all field work begin with information collection about roles, which will inform outreach to women as well as men.

The typical gender division of labor also assigns women the unpaid household tasks of cooking, cleaning, childrearing, and water and fuel collection. They may process products like milk or grain for home use or market. Their heavy workload is often the limiting factor in improvement of livestock production. Labor saving technology to reduce drudgery could free up time for livestock production tasks, but women also need incentives such as cash, permission to travel, or even simply respect for their work.

2.7.3 Marketing

The sale of livestock and livestock products is usually done by men rather than women because of tradition, greater mobility and greater knowledge of markets. Women's groups have proliferated which permit women to sell their products together, often through an NGO as an intermediary. They often have informal "micro-channels" to sell to neighbors or through the extended family, but as production increases, more profit comes from the formal market (Maarse 2011)

2.7.4 Bundling development services

NGO's, the private sector, cooperatives and government have developed many interesting models to bring livestock services and markets to women who have been isolated by tradition or geography. Often these partnerships are similar to the vertical integration practiced by industrial producers (organizing all inputs and outputs), with both profit and social progress as coexisting goals. In addition to technical training, inputs and markets, the best of these models provide explicit training on gender awareness and analysis to both men and women, and facilitate discussions to overcome gender constraints and improve family life for all.

The "bundling," of services also runs the risk of conflict of interest for the intermediary, and the challenge to develop competency in different areas such as finance and agriculture. A careful set of institutional checks and balances, as well as explicit and well developed communication channels is essential.

3.1 Solutions to women's constraints in production and marketing

In South Asia, the cultural attitude about the low value of women and their work is the main constraint to mobilizing the resources women need to end poverty and hunger. However, culture is dynamic and diverse, and change has started to take place. The attitudes and behaviors of men and women change in response to economic and social incentives, role models, life experience, national and local policies, religious authorities, work policies and exposure to options. Participatory research and training encourages people to reflect on the questions "why are things the way they are?" and "how do we want to be in the future?"

Sustainable and people centered development is only possible when all participants in an intervention like animal health reinforce the message that women are important livestock producers who need services, inputs and income to improve the lives of all members of the their families and societies. South Asian culture is very hierarchical, and change will not come unless leaders, directors and bosses themselves model gender aware language and behavior. Men must be reassured that the benefits of wives earning and using income or attending training will outweigh the criticism they may invite by adapting traditions to meet current needs. Successful interventions need to commit to an ongoing linkage of social and technical messages, and to make participation comfortable and relevant for women.

Changes in attitude and behavior come slowly, but they come. A great deal has been written about the effect of quotas for women in India's panchayats or local government. A study in India in 2002 found that women in Rajathstan who participated in local government required family support but became confident and respected in their community, despite initial hostility and their own fear and lack of experience (Vögele 2002).

Women's constraints from poor health, illiteracy, lack of mobility, low confidence, need for resources and invisibility can be addressed when development actors agree that the change is needed, and provide the leadership, vision and resources to make it happen. For GALVmed, this means policies, partnerships, training, accountability and advocacy that promote sustainable improvements in women's position and condition so they can access and benefit from new animal vaccines and medicines.

GALVmed must work with partners to develop vaccines and other animal medicine, and to deliver them in a meaningful and comprehensive way to achieve its goals. GALVmed must decide how much effort to put into influencing partner policies and behavior.

3.2 Institutional issues

An institution is any social structure governing the behavior of a set of individuals within a given human community, with rules and enforcement. Institutions range from formal governments to businesses, caste groups, NGO's, the family and the market.

GALVmed must work with institutions such as government agencies, private companies, cooperatives, and NGO's to develop and disseminate animal health products. To benefit women, GALVmed and its partner institutions will need political will and leadership, enabling policies, the necessary assessment system, adequate training, a line item budget and positive rewards.

3.2.1 Policies

Gender policies are public commitments by institutions to deliberate actions to ensure women's access to and benefit from resources and skills they need. Strategies for implementation include training for all staff so they understand the cause of and extent of gender inequality, and its harmful consequences, and how they are expected to be part of the solution. All staff need some basic training in gender analysis, to understand why gender is crucial to achieving organizational success.

Gender policies also state the gender related goals of the institutions' activities, the impact expected on both men and women, and the strategies to achieve the results. The monitoring and evaluation system must be robust enough to detect changes in people's attitudes and behavior, and flexible and easy enough to be useful in the field. There must be adequate staff and budget to achieve results. In the past, many organizations made lofty statements committing themselves to empowering women, but without a budget, specific activities and clear indicators, very little change took place.

Organizational policies include criteria for partnering with organizations, and an approval process that includes a gender checklist. Government agriculture ministries in South Asia are necessary partners that often lack many capacities including adequate accountability, and outreach to women and the poor. GALVmed can be a critical force for upgrading these institutions.

Gender policies also commit organizations to gender balance in staff positions, which may be challenging in South Asia. To recruit and retain talented women, gender policies must explicitly prohibit sexual harassment of any sort, and include a safe system to address grievances, for GALVmed and partner staff. Providing safe transportation while traveling may reassure anxious family members. Mentoring of female staff and opportunities to enhance skills is helpful. Family friendly policies such as parental leave, flex time and shared positions, and assistance in finding positions for spouses also help women succeed in previously male institutions, by acknowledging the reality of both domestic and workplace obligations. Men find these policies also improve the quality of their home life (InterAction 2010)

Other components of gender policies are selection criteria for board members and leadership. In addition to gender balance, boards should include leaders with experience and skill with gender mainstreaming in agricultural institutions, and knowledge of and commitment to pro-poor and pro-women development. Upper management should have commitment and capacity to implement gender policies.

One staff person should be charged with coordination and implementation of gender policies throughout the organization, with adequate budget and authority although responsibility must be shared at every level.

3.2.2 Accountability, Data and Statistics

Both public and private institutions need valid data to make strategic decisions and rational budgets. Therefore, improved data collection about the role of women in livestock production, processing and marketing is essential. Women already contribute their labor and skill in feeding, cleaning and milking animals but until this is recognized as productive work, it will remain invisible and undervalued. Writing about mountain women in the Hindu Kush, Guring (1999) notes that rural agricultural data collection "suffers from the myopia of labeling women's work as "domestic," and therefore "trivial," and undeserving of attention and funding."

The late Pakistani economist Mahbub ul Haq developed the first Human Development Index in 1990, to make the point that Gross Domestic Product (GDP) and income generation did not automatically translate into improved human welfare. When data surveys are male focused with little acceptance and understanding of the role women play, the process of measurement itself has numerous flaws which undermines good decision making (Mahbub ul Hag Development Centre 2003).

FAO developed the Agri-Gender Statistical Toolkit after finding that not all data specialists were experienced collecting, using, interpreting or presenting gender data. The need for sex-disaggregated agricultural data was especially important at the national level, to inform Ministry of Agriculture decisions. This toolkit presents examples of gender relevant questions and tables to produce a database in line with the framework of the 2010 round of the World Programme for the Census of Agriculture (FAO 2010).

Alary et al (2011) used an assets-based approach rather than financial estimation to measure the value of livestock outputs in reducing poverty, which captures more of the "non cash," value such as security and reduction in risk, as well as food, fertilizer, savings and draft power. This is especially relevant for capturing the impact on women and the poor because they are often on the margins of the market economy. Strong metrics can build political support for better interventions.

Another drawback to classical economic measurements of cost benefit ratios is the assumption that the household shares resources and work both equally and efficiently. Newer and more sensitive models are based on game theory and utilize a cooperative bargaining framework based on the Nash equilibrium, in which household members do not necessarily share the same preferences and try to pursue, at least partly, their own interests. The allocation of available household resources is based on the bargaining power of each member. (Seebens 2011). Since GALVmed interventions are to empower women, their assets, including training, knowledge, inputs, autonomy, time use, respect and confidence, need to be included in monitoring and evaluation.

The time frame for evaluating success also has a gender dimension, since change in the well-being of women cannot be achieved in 5 or 10 years. Production and income indicators are easier to quantify than women's status, which require different approaches such as group discussions rather than household surveys. However, even informal data can be quantified to yield information on important trends such as attitudes and behaviors.

Data is only as useful as its interpretation and use, whether in government or individual projects. The purpose of assessment is to see if adjustments are needed in a plan to accomplish the goals. Interpretation and use of data should not be limited to the requesting agency or central office, but intentionally shared with the people impacted (Stewart 1998).

3.3 Advocacy

GALVmed's vaccines and medications can only have their beneficial effect on people and livestock when national and local policies become more favorable to women and other marginalized groups, which requires advocacy. Therefore increasing women's voice in national bodies like producers' unions is essential to empowerment and will involve training and commitment to the political process. Even after positive legislation is passed, constant monitoring is required to ensure actual implementation and document impact.

Increasingly quotas for women have proved to be useful for opening doors and normalizing women's participation in decision-making. Only women with the support of their families can participate in politics like panchayat seats due to quotas in India, but they report increased confidence, and respect from the community. How this will translate into national policies and practice still remains to be seen.

A national issue to be addressed is expansion of basic services in rural areas in order to ease women's multitasking demands in the home and on the farm, and to develop appropriate technologies that reduce the amount of time women spend on daily household tasks. The time gained by reducing household drudgery could be invested in improving women's health and productivity (Balakrishnan 2005).

Reform of Agriculture Ministries to comply with national and international agreements to benefit women is still needed, and pressure from organized groups can catalyze the process. The coalitions of animal health actors that GALVmed is developing can add to pressure for meaningful reform. Another national issue is the need to formalize women's rights to land and other productive resources. Land titles are largely in the name of men, and rarely is joint ownership promoted, even under large scale government programmes. (Kumar 2009).

After the Beijing Platform of Action for Women was accepted in 1995, most national governments created or tasked women's ministries with responsibilities of implementation and monitoring women's participation in political and economic life, however funding and authority was often inadequate. The technical ministries such as agriculture continued with business as usual, and these two parallel paths for development seldom crossed.

Balakrishnan 2005

National statistics are rarely gender disaggregated, so that women's economic contributions and gender constraints remain hidden. Attention and budgets only accrue to issues that get measured. When data collection uses the household as the unit of impact, women are invisible. Therefore, the unitary household model must be replaced in both assessment systems and mindset (Hill 2003).

An example of successful grassroots advocacy in SA is the Self-Employed Women's Association (SEWA) in India. It has moved from organizing women in the informal economy through a combination of trade union and co-operative principles to seeking to put pressure on the state government for greater responsiveness to the needs of poor women. It has been lobbying to make the International Labour Organization (ILO) less a voice for organized, predominantly male workers and more representative of the world's informal workers (Kabeer 2003).

Legislative success for women in Bangladesh includes the 2009 draft of the National Agriculture Policy which includes commitments to women's access to agricultural extension and their "technological empowerment." The need to ensure women's access to productive resources, inputs, and services is highlighted in the National Food Policy (2006). The policy agenda outlined in the *National Strategy for Accelerated Poverty Reduction* (NSAPR-II) also makes numerous references to ensuring that extension services reach women in relation to crop production, including high-value and cash crops, and in livestock, fisheries, and forestry. The 2007 *National Livestock Policy* includes commitments to increasing women's earning in relation to the marketing of milk, meat, and eggs. It remains to be seen how these commitments will be implemented, and if meaningful change will be achieved (ABD 2010).

GALVmed will need to decide how much effort will go into advocacy. It can leverage its investments to increase the pressure on Ministries of Agriculture, Commerce, Trade and Finance to enact and enforce policies more favorable to women and the poor.

3.4 Partnerships

3.4.1 Research Institutions and Universities

Partnerships between institutions create synergy and mobilize resources unavailable alone. GALVmed will be engaging with universities and research institutions due to the highly sophisticated nature of the vaccine technology and the need to monitor animal health indicators over wide areas. However, livestock researchers in South Asia, as well as the rest of the world, have typically focused on technical solutions to productivity in isolation of the people who depend on their animals. Research should include rewards for linking labor saving technology for women so they will have the time to use other technical innovations. Technology is useless without a reliable system of distribution, which will depend on human behavior as well as physical infrastructure.

In India, Ghotge (2002) calls for reform of academic agricultural programs to include training in social context and different farming systems. Often agricultural graduates are trained to work with only large scale producers, and assume they need to provide advice only to men.

The curriculum in agricultural universities does not consider gender and other social issues important, and this omission is then reflected in the policies developed and implemented for agriculture (Ghotge 2002). Curricular reform will then influence policy, and vice versa. Innovation on collaboration and linkage between technical and social development needs to be encouraged and rewarded at all levels.

3.4.2 Non Governmental Organizations (NGO's)

NGO's are abundant everywhere in South Asia except for Bhutan, perhaps to fill the void of weak public services. NGO partners can provide grassroots links and social mobilization, but they can vary in their sensitivity to gender and social exclusion, and their capacity to encourage both men and women to raise women's status. Experience with gender is a reasonable criterion for selecting partners. In recent ADB projects, partner NGO's were required to have 50% female field staff and past experience working on gender and development issues.(ADB 2010).

GALVmed can develop and share gender mainstreaming policies and practices to build up the capacities of all its partners.

3.4.3 The Private Sector

South Asia is fortunate to have many successful "social entrepreneurs" which use market forces to empower the poor, and meet their "bottom double line" of profitability and social change. They make good partners, and can share their methods with GALVmed's other partners. Profitability is necessary for sustainability, but the power of the marketplace does not necessarily empower women and the poor, so specific goals, budget and monitoring are important. Increasingly, social entrepreneurs find that "fair trade" or "women empowering" products command a premium price.

Increasing women's use of animal health inputs is good for the private sector selling them, and the more they make their shops woman-friendly, the more they can benefit. Hiring women as clerks or technicians, maintaining clean and safe premises, and offering verbal instructions to the illiterate can increase female customers.

3.4.4 Producer organizations

Except for the small percentage organized by NGO's, livestock producer groups and cooperatives are mostly male, and need training and incentives to become more inclusive and effective. If their objective is to be the voice of producers, women' voices must be heard, since their concerns may be different from their men folk. IFAD (2010) identified the following steps to increase women's voice in producer groups.

1. Training for all members in identifying gender based constraints and developing solutions and gender accountability.
2. Change membership criteria from formal land ownership to animal ownership, or animal usage.
3. Establish quotas for women in leadership, to increase visibility, and establish the necessary critical mass to bring about policy and institutional change. Add women subcommittees to build women's capacity and identify concerns.
4. Form networks of producer groups to share information and strategies on gender and other issues.
5. Lend assistance to legalize women's community based producer groups, which tend to be informal.

If producer groups are not amenable to representing their female constituents accurately, women may need to form their own organizations.

Promoting gender equality strengthens producer organizations by increasing transparent and democratic decision making, and also benefits poor men and other marginalized groups. Pro-poor policies are also needed since inclusion of wealthy women does not necessarily benefit poor women.

3.4.5 Women's groups

When women organize themselves into groups they become more powerful. Some groups focus on literacy or health, while others provide information or support for income generation. Because South Asian women are raised to defer to men, and not value their own opinions, it is often easier for women to operate in all-women groups, at least initially. However, mixed sex groups can bring more resources to the members. In Bangladesh, the CARE dairy project found that mixed groups have been more successful than female-only and male-only groups. It is assumed that this success reflects the group's mixed skills and experiences (homestead and market-based) (Sadiqquee 2010).

An examination of contracts with international food companies shows that fewer women than men are members of contract farming schemes. However, companies note that women smallholders produce better quality products, and would prefer to deal with them, but they are not organized into formal producer groups which negotiate the actual contracts (Chan 2011). Therefore, helping informal women's groups to develop into formal producers' groups helps them in the marketplace.

Despite the well documented benefits of joining groups, not all women can join. Rural women are busy from their heavy workload. Some groups require a fee to join. In mixed groups, women may be members but not decision-makers (Kumar 2010).

Working with groups is a major strategy for women to increase their control of assets, improve their productivity, and enhance their status and well–being. In fact, the social capital that groups generate has been recognized as an important asset in itself. But building social capital is not costless. Women in poor households face particularly serious time constraints because of their various livelihood activities and childcare responsibilities. It is easier for poor women to contribute small amounts of money, for example, during each meeting, rather than pay lump–sum fees (Quisumbing 2009). Social inequality and ethnic differences may also create barriers to social capital accumulation (Kumar 2010).

3.5 Program Issues

3.5.1 Participatory Strategic Planning

Important strategies to improve delivery of animal health products and services to women are participatory planning with a gender focus, and more women staff in the field. All participatory tools require training and commitment to the staff using them. Many NGO's make good use of these tools, but to scale up to reach more farmers, government and private extension systems will need to recognize the need and make the commitment. This requires leadership, commitment, budget, monitoring, rewards, and of course, effective trainers! Luckily, many excellent models and resources are available, from NGO's like Heifer International, BRAC and Anthra or donors like DfID, FAO, IFAD and World Bank.

The Asia Development Bank (ADB) in Sri Lanka used participatory strategic planning to develop a Gender Action Plan (GAP) to ensure that all of its interventions promoted women's participation at the household and community level. This required more extensive data collection prior to implementation, and use of quotas to ensure women's opportunities. Women's rural development societies (WRDSs) were formed alongside rural development societies (RDSs) for men. When participatory needs assessments (PNAs) were conducted, separate sessions were to be held for women, and their needs incorporated in village development plans (VDPs). The NGOs selected for social mobilization had to include at least one women focused NGO in each district and all NGO staff must have received gender training (Thomas 2010).

Women stated that although they participated with their husbands in household decision making before the project, they now cooperate on community level work as well, which they had not done before. Women appreciated the "gender training," sessions with their husbands because they created an opportunity to discuss the division of labor in the household, which would not have occurred spontaneously. Husbands had not realized that household responsibilities limited wives' time for income generating activities, which could only be overcome if husbands assisted more in the home.

At the community level, group mobilization into separate groups ensured that women's voices were heard and their priorities considered in funding of subprojects, which did not happen in the past. Women now know how to develop proposals for presentation to local government for funding (Thomas 2010).

3.5.2 Extension and training

Despite the variety of agricultural extension approaches that operate in parallel and sometimes duplicate one another, the majority of farmers in India and South Asia, who are smallholders, marginal and female, do not have access to any source of information. This severely limits their ability to increase their productivity and income and thereby reduce poverty (Glendenning 2010).

Government livestock extension in South Asia is weak and targets men, especially the wealthy. NGO or cooperative funded extension is available in certain places, but the male agents usually do not see women as farmers or users of technology, or even worthy of teaching. Women's phone calls to livestock technicians would go unreturned, while men received immediate attention (GODHAN 2010).

Animal health technicians and veterinarians in South Asia do not learn about gender or participatory training while in school, so NGO's often invest in "Training of Trainer," programs to increase their impact. Professionals tend to present information in the same format in which they learned it, written and with scientific words, even to illiterate farmers. Trainers must give themselves time to learn about the local situation, and recognize that "one size does not fit," all situations. For example, it is often necessary to arrange separate activities or Field Days for men and women, which is not part of the job description (CALPI 2008).

Training livestock specialists in gender analysis is often more effective when the trainer has a credible background in agriculture rather than social sciences. Although many young women are enthusiastic proponents of gender equity, they may not command the same respect as an older facilitator. Male trainers are necessary as well as female, to serve as role models. Organizations tend to task their few women staff with the additional role of gender advocate, but it is often not possible for them to stand up to male hostility or indifference without training and support (Heifer 2004).

Training field staff in participatory and gender responsive extension is a long term commitment, especially in the hierarchical South Asian context. The initial training needs to explain the concept of gender, and how gender roles are constantly changing. They must learn how to facilitate gender analysis in actual villages, where they can discover along with the farmers that women and girls have less food, health care, time and respect, which limits their ability to increase livestock productivity. Their lack of education and confidence will limit their children's futures.

After initial gender training, frequent follow up is necessary for these front line workers, to help them deal with the inevitable frustrations, challenges and hostility. They need support to learn how to deal with the reluctant husband or father. Rewards for positive efforts are critical, as are sharing successes

Extension tends to focus on infectious disease, a major cause of livestock loss. However, non-infectious causes of poor health, such as inadequate nutrition, housing or too many parasites may cause larger losses, which mitigate benefits from vaccines. A case study from India recommended that extension in poultry needs greater emphasis on the needs of the poor, especially on non-disease issues, such as predation and hatchability, while recognizing the importance of Newcastle Disease vaccination. It also noted that men and women require different media for outreach and training (Conroy 2005).

Extension, veterinary and livestock services will serve women better when they have more women on staff. Although the number of female veterinarians and livestock technicians is rising across South Asia, it can be hard to recruit them to work in rural areas, especially if they have an urban background. Increased recruitment of rural people who will return to their home areas can help, but they may need scholarships for advanced education. It is often easier to recruit groups of girls for distant veterinary education, and to arrange for them to travel and live together in groups to assure their families of their safety. Husband and wife veterinary teams can be easier to hire and deploy to rural areas, especially with a premium salary. Foreign veterinarians with a humanitarian interest are another possibility, but national veterinary organizations may oppose this as a threat to their territory.

Improvement in animal health services at the community level will only improve when trained people are living there, so it is important to recruit and train more local people, especially women, in basic animal care, since veterinary coverage will remain limited in the near future.

Village women are increasingly recruited as AI technicians, milk transporters, vaccinators or paravets. In Bangladesh, CARE B designed special bicycle wagons that were acceptable for women, and they were hired to pick up milk from other women to deliver to the cooperative (Sadiqqee 2010). In Bangladesh, BRAC has targeted women as poultry vaccinators, and found that they increase the vaccination rate by reaching more women farmers, which has a huge impact on the poultry situation in the area (SAPPLPP 2009).

3.5.3 Women in Community Animal Health Worker (CAHW) or Paravet Programs

Anthra is an Indian NGO in Orissa state focused on sustainable livestock development and women's empowerment. Their Animal Health Worker (AHW) training also looked at women's health issues, gender relations and natural resource use. The women AHWs were encouraged to work closely with other women in the village and share their knowledge in the village women's groups. These women have gained considerable respect from the rest of the community. They are now recognized as persons who possess specific skills and, very importantly, they are accessible to the villagers. Other women in the women's groups, who were previously entirely dependent on their husbands when the animals fell sick, have expressed that now they are able to get assistance and advice immediately from the women AHWs, who are always available in the village (Ghotge, 2002).

CARE Bangladesh also found that families were more likely to permit women to serve as CAHW's after staff gave personal explanations about the work, and the need to travel. Despite the initial stigma of women traveling about, women were attracted to the work because of the respect and income it brought when they could provide an appreciated service to their communities (Sadiqqee 2010).

The greatest challenge for the female CAHWs was the need to travel at night to attend an emergency. Initially, CARE-B staff had to physically accompany the women, until the families could accept it. This commitment to long term "accompaniment" through the long learning curve of new roles and responsibilities for women accounts for the trust and success that the best NGO's have been able to achieve.

Other strategies to increase the success of female CAHWs include intentional introductions to other livestock workers such as AI technicians, veterinary workers and the Department of Livestock Services. Public ceremonies where new graduates receive certificates and tool kits can also increase their credibility (Sadiqqee 2010).

3.5.4 Credit and financial services

Because women rarely own land, they have no collateral for bank loans to start or expand livestock enterprises. Some banks, such as the Grameen Bank in Bangladesh specifically target women for loans (FAO 2010). Women use their small loans to purchase goats or chickens, which reproduce quickly so they can pay back their loans and still realize a profit.

Microcredit, or lending to a group with "social capital," rather than collateral, is often directed to women, and can provide much needed funding. However, loans are sometimes appropriated by male members of the family, so careful monitoring of the groups and individuals is required. Group savings accounts are often used to help women protect their investment. Other financial services which poor rural women appreciate are savings accounts, mobile services and extended hours to accommodate their long workday (Grameen 2011). When available, mobile phone banking is particularly useful for women. Although micro-lending and other small scale financial services can be profitable when implemented properly, many poor quality microcredit organizations sprang into being when donor money started flowing. Common accepted standards have been developed and should be followed (IFAD 2010).

3.5.5 Integrated services for women

The 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 supplies (parent stock, feeds, vaccines) and services (training, credit, extension) activities and involves women in all these areas (Dolberg 2001).

Because of women's limited mobility in South Asia, success often depends on bundling all aspects of production, marketing, training and social awareness. However, management needs to keep the threads distinct, since different but specialized skills are needed. If separate organizations provide different services, a system of coordination and communication is necessary for each farmer to realize benefits.

The "business hub," is an interesting innovation, and is used in the dairy industry in East Africa. The hub is the chilling plant where farmers bring their milk, but financial services, extension advisors and input sellers are in the same physical location. In order to benefit women, the dairy plant and the farmers must work out arrangements so women can access the dairy income, for example using household accounts, rather than sending a check to the husband (EADD 2010). In South Asia, extension must be willing to organize separate sessions for women. The hub concept can be extended to other livestock value chains such as poultry and small ruminants.

Biogas digesters are increasingly available in India and South Asia, but should be promoted more by all participants of the livestock value chain. Biogas is generated from animal manure, and provides fuel for cooking and lighting, leaving a slurry suitable for fertilizer. Not only is biogas more sustainable than burning dung for cooking, because its fertilizer use is retained, but it improves women's health because the gas is a cleaner fuel that burning wood. Eye irritation and infection from wood or dung smoke is one of the most common health problems for rural women. Biogas also protects forests by eliminating the need for wood for cooking (Biogas 2011).

3.5.6 One Health

The fields of human and veterinary medicine are increasingly working together on public health issues, a process now dubbed "One Health." This is especially valuable for reaching women in remote areas who are responsible for the health of both their children and their livestock. The potential is most clear when zoonotic disease can be controlled by sanitation, which is usually the responsibility of women. VPH infrastructure is extremely weak in South Asian countries, despite the concerns about Avian Influenza, so joining forces with human medical experts brings many advantages like human and physical resources and new models. One Health approaches must capture gender disaggregated data to be meaningful.

The potential for linking human and animal health protection through mobile vaccination clinics to serve the remote populations is promising. It is being done in Sudan, Chad and Mali and could be relevant in remote, less accessible areas of South Asia. For women and children, linked human/animal vaccination programs are especially hopeful. They often remain in camps while men travel to towns to sell livestock and purchase supplies on market days. Women of childbearing age would especially benefit from tetanus vaccination, and their workload would be easier with healthier children and livestock (Schelling 2007).

Animal health messages are similar to human health messages, especially regarding sanitation, neonatal care and vaccinations. Information on animal health can be shared with clients at rural human health clinics, since most mothers also manage livestock. In a small ruminant project in Morocco, women livestock extension officers stayed in villages for two weeks at a time, and linked care of babies to the care of goat kids, teaching about vaccinations, feeding, sanitation and diarrhea management. Maternal health in humans and goats is similar enough that some mothers understood their own reproduction only after learning about goat reproduction (Kanoubi 2004).

In human medicine, both village level providers and their primary clients (mothers) are women, who also care for livestock Models for recruiting rural women as health care providers can be learned and adapted to animal health. The One Health Model encourages sharing of models and ideas, as well as facilities, personnel and information, and is not limited to direct control of zoonotic disease.

4.1 Trends for the Future

Climate change and "missing women," are two trends that will affect the future of livestock development in South Asia. Climate change is already causing shifts in rainfall, causing floods, droughts and other weather disasters. Deforestation and other forms of environmental degradation exacerbate erratic weather patterns, which increases women's workload of collecting fuel and water for household consumption. Any livestock intervention must address the need for labor saving technology for women, especially when increased confinement is recommended (FAO 2011).

The "masculine," or imbalanced sex ratio in South Asia will lead to social changes that can barely be imagined. Already in China, there is a shortage of women of a marriageable age, shifting productive and reproductive patterns. What will these unmarried and "undomesticated," men do? Will prostitution increase? Will the birthrate plummet? Will wars increase to engage the surplus of men? Will dowry fade as all girls become more valuable? Even when policies and behavior result in equal numbers of male and female births again, there will be repercussions from this demographic "bump," for years to come.

5.1 Conclusions

Women's roles in South Asian livestock production have already started to change, as more women participate in groups, and engage in marketing and public meetings. Due to male outmigration, rural women have taken on more physically demanding agricultural chores in addition to their previously heavy workload. Men's roles have not adapted in the same way. For instance, the rigid boundaries of social norms and acceptable "masculine," behavior for men have been maintained (Balakrishnan 2005). They may refuse to take on unpaid domestic tasks such as bathing children, washing clothing, or collecting water or fuel wood, to free up women's time for training. Transforming gender roles to improve the lives of all members of society will require active change from both men and women.

Gender norms are complex and can change in response to shifting economic, political, and cultural forces, which can create new opportunities for women and men. They do not change overnight, and attempts to directly challenge such norms may unintentionally erode women's claims to resources.

Strategies that challenge gender norms must be weighed against other project objectives, such as increased food security or better management of natural resources, which themselves may transform gender norms over time. Encouraging women to define their needs and preferences prior to the design of projects may help to ensure a balance between challenging and respecting local norms (Kumar 2010).

Other livestock organizations are trying to mainstream gender equity and empower women, and GALVmed can learn from their experience.

1. Invest in institutions and people as well as technology.
2. Vaccines, medicine and other technologies have limited impact without equitable and efficient distribution systems, and linkages with improved management and access to markets.
3. Market incentives work best after women's skills are upgraded to be competitive. Markets create wealth, and can work in favor of women and the poor, but only when policies and practices do not favor large scale producers and men.
4. Social attitudes and behaviors change over time, but they change slowly so patience is essential. This must not be an excuse to accept an unjust status quo.
5. Include men in gender programming since both men and women must adap to make a better future.
6. The empowerment of women is a valuable goal in itself, as well as a means to other goals, such as improved child nutrition or livestock productivity.

6.1 Recommendations to GALVmed

For GALVmed to achieve its goal of sustainable animal health systems for rural producers, it needs an overall strategic plan, which includes gender mainstreaming for vaccine development and delivery. A written gender policy committing itself to empowerment of women, and consideration of women's needs and preferences in addition to men's, is also necessary, along with organizational policies and practices. At the project level, GALVmed should develop gender mainstreaming protocols to be used by its own staff or partner staff, with a robust monitoring system to ensure compliance and make adjustments as needed.

An important ingredient for success for gender programming is commitment from the top. When the boss prioritizes gender equality, managers and staff take notice, and are more likely to implement appropriate activities. A good example is GALVmed's April Newsletter, when CEO Steve Sloan refers to supporting low income farmers... and their husbands! It's a good reminder to readers of the need to examine assumptions and always keep gender in mind (GALVmed 2011).

Upper management also needs to agree on the importance of the gender issue and the approach. A gender workshop for senior management and the board leaves everyone using common language and sharing a common vision. This workshop will make the case for gender mainstreaming by presenting the extent of gender discrimination, and the devastating effect that women's low status has on animal health and productivity, as well as on their families and wider society. Only after reaching a common understanding of the seriousness and far reaching extent of gender disparities can GALVmed move on to choosing solutions and implementing them.

6.2 Institutional Issues

A useful method to begin a gender strategy is a comprehensive review of an institution's strategic plan from a gender perspective. A key question is whether GALVmed is ready to make the empowerment of women an explicit goal of all its activities, as well as a means to improved livestock production. An implied commitment to women through the words "people," or "farmers," is not sufficient, nor is "adding women's groups," to an existing process that may not have addressed women's needs from the start.

A Gender Audit is used to develop a strategy through a staff survey, discussions with focus groups, and finally writing an Action Plan, based on the experiences of staff and partners. A plan developed with the staff, rather than for the staff, is central to buy-in and support (InterAction 2010).

6.2.1 Gender Policy

GALVmed should develop a written gender policy, confirming a commitment to gender equality, and addressing personnel, board and partnering issues. It must prohibit sexual harassment of staff and provide written procedures for grievances. Gender balance is important for board membership and senior management, but so is experience with gender mainstreaming in other agricultural settings. Increase recruitment and retention of women staff through mentoring, family friendly policies, safe travel and opportunities to increase skills. Set criteria for NGO partnerships based on alignment with goals of women's empowerment and capacity for implementation. Consider the ADB model in Sri Lanka in which 50% of NGO partners in an area must have existing gender expertise. Preference should be given to partnerships with organizations run by women, such as the NGO Anthra in India. Preferentially partner with private firms that are "social entrepreneurs," with a double bottom line of profits and positive gender changes.

It will be necessary to work with large research and extension institutions that do not have strong gender capacity yet, but GALVmed can leverage its investments and expertise to build political will for systemic change. Initiating reforms starting at the top may have the most far reaching impact in animal health care in the future.

Selection of species and diseases for vaccine development should take into account poor women's preferences. Prioritize small ruminants and poultry vaccines, since losses among these species can disproportionately impact women and the poor. The elimination of their modest livestock assets can deepen the spiral of poverty, while protection of these livestock resources saves the most vulnerable of human lives.

Effective and equitable distribution of animal vaccines and health products will take massive investment and innovation. Most small scale farmers, both male and female, do not have access to any type of professional extension, so they rely on agri-chemical dealers or traditional healers for advice (Heffernan 2003). GALVmed will need to partner with all these groups to reach farmers, and use this opportunity to upgrade their skills, both technical and gender related, and facilitate good working relationships between them. Often there is mutual hostility and suspicion between them, but traditional healers often have useful treatments, and could expand their effectiveness by linking modern and herbal medications. They also live in the community, so they can be more available to farmers. Extension agents and store owners also need training and incentives to think of women as farmers, and to make their training and wares accessible to them.

Action plans need to explain how women will be included or affected, and how the activity promotes empowerment of women. The action plans need to be reviewed by an expert for gender content, and reevaluated in light of monitoring data. Every workshop on animal health should include a discussion of women's roles in animal care, and what women need to improve their productivity.

In research labs, recruitment of women scientists and technicians should be monitored. In research trials, questions about access for the final user should be asked. Product packaging and advertising can appeal to women customers, and normalize the public image of women using technology successfully.

A Gender Board of Advisors could increase the scope of GALVmed's expertise. A "Gender Learning Community for Livestock Development," composed of GALVmed staff, partners and advisers, can share experience and enhance analytical skills, to improve impact and permit "scaling up" of successful strategies.

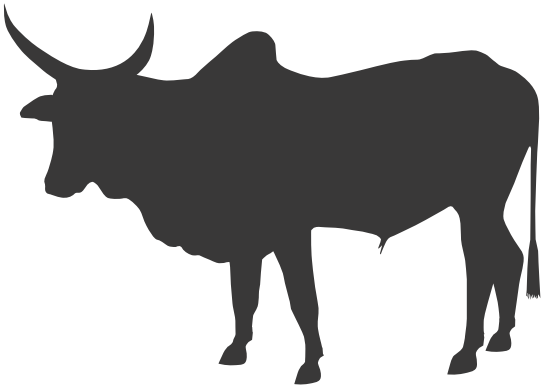
6.3 Field activities

"Training of trainers," in gender analysis is crucial for all front line extension staff and their supervisors. Workshops and learning groups help build support and skills over time. Positive framing of gender mainstreaming is essential, with an emphasis on healthier animals, and happier and more harmonious families that work better together. Incentives for shop owners to learn skills include workshops in market research, which will reveal the vast number of potential female customers they can attract. They can learn about roving stores on wheels, or home delivery of inputs to women isolated on farms. The cell phone revolution softens the impact of women's seclusion.

6.3.1 Monitoring and assessment

If raising women's status is a goal of GALVmed's work, this must be reflected in the monitoring system. The project assessment process should monitor women's workload and use of income as well as numbers of animals vaccinated and increased production. Ideally groups of women should set their own indicators of success as well. Child nutrition is a good proxy for women's control of cash. Informal or participatory research works best for monitoring intrahousehold or community level changes in attitudes and behaviors, but requires more trust and training than simply hiring anonymous enumerators for surveys.

GALVmed has the opportunity to impact the quality of life in South Asia not only through new vaccines and medicines, but upgrading the entire system of animal health, to ensure that poor women have the tools they need for healthier animals, and translating increased production into healthier families in a sustainable environment.



Bibliography

Agboatwalla, H. 2002. *Studying gender perspectives in knowledge, attitudes and practices concerning tuberculosis in Pakistan's Sindh province*. World Health Organization (WHO), Geneva.

Agricultural Information and Communication Centre of Nepal (AIDCC) 2008 Agricultural Diary, Nepal Ministry of Agriculture and Cooperatives, Kathmandu.

Alary, V, Corniaux, C, Gautier, D. 2011. *Livestock's Contribution to Poverty Alleviation: How to Measure It?* World Development. Elsevier. http://www.sciencedirect.com/science/article/pii/S0305750X11000271

Asian Development Bank (ADB), 2003. Second Participatory Livestock Development Project, Bangladesh. http://www.adb.org/gender/practices/agriculture/ban003.asp

ABD, 2006. Gender Checklist: Agriculture. http://www.adb.org/Documents/Manuals/Gender_Checklists/Agriculture/default.asp

ADB, 2010. Country gender assessment: Bangladesh. Mandaluyong City, Philippines

ADB, 2010. Gender equality results case studies: The Community Livestock Development (CLDP) Project Nepal. Mandaluyong City, Philippines

Baden,S. et al. 1994. Background report on gender issues in Bangladesh. Report prepared for the British High Commission, Dhaka. http://www.iiav.nl/epublications//1994/Background_report_on_gender_issues_in_Bangladesh.pdf

BAIF Development Research Foundation, access 23 February 2011. http://www.baif.org.in/aspx_pages/index.asp

Balakrishnan 2005. *Rural women and food security in Asia and the Pacific: Prospects and paradoxes*. FAO/RAP. Bangkok.

Baden, S, Green, C, Goetz, A, Guhathakurta, M. 1994. Background report on gender issues in Bangladesh. Institute of Development Studies, Brighton.

Banu, L.F. 1987. *The role of Bangladeshi women in livestock rearing*. In A.M. Singh & A.K. Viitanen, eds. Invisible hands. Sage Publications, New Delhi, India.

Biogas, accessed 2 May 2011. http://biogas-digester.com

Bhatt, E. 2000. SEWA: Women in Dairying, in Indian Dairy Industry Yearbook, P R Gupta, Delhi. http://www.indiadairy.com/info_women.html

Bhutan Nuns Foundation (BNF), 2009. Concept Paper. Thimphu. http://www.bhutannuns.org

Bhagowalia, P. et al. 2010. *Unpacking the Links Between Women's Empowerment and Child Nutrition: Evidence Using Nationally Representative Data From Bangladesh* presented at Agricultural & Applied Economics Association 2010.

BRAC (Bangladesh Rural Advancement Committee), 2011. http://www.brac.net/content/social-enterprises-livestock-and-fisheries

CALPI, 2006 (Capitalization of Livestock Prgrammes India). *Towards Accelerated Growth in Dairying: An Action Research to Improve the Traditional Milk Sector*, KHAMMAM, ANDHRA PRADESH. Summary Report. Intercooperation in India, Hyderabad.

CALPI, 2008. South Asia Regional Workshop on Livestock and Development in a Changing Context. SDC (Swiss Agency for Development and Cooperation and Inter Cooperation). Hyderabad. http://www.intercooperation.ch/SAWshopProceedings.pdf

Campbell, K.L.I., Garforth, C., Heffernan, C., Morton, J., Paterson, R., Rymer, C. and Upton, M. (2006). Smallstock in Development, DFID Livestock Production Programme, Natural Resources International Ltd, Aylesford, Kent

Community Livestock Development Project (CLDP) 2005 Department of livestock Services, Hariharbhawan, Lalitpur, Nepal. http://www.cldp.org.np/

CARE, accessed 12 January 2011. Framework for Understanding Women's Empowerment: Women's Empowerment SII Framework. http://pqdl.care.org/sii/Pages/Women%27s%20Empowerment%20SII%20Framework.aspx

Chan, M. 2011. *Improving Opportunities for Women in Smallholder-based Supply Chains: Business case and practical guidance for international food companies*. Bill and Melinda Gates Foundation.

Conroy, C. 2005. *Improving Backyard Poultry Keeping: A Case Study From India.* Agricultural Research & Extension Network (AgREN). http://www.odi.org.uk/work/projects/agren/papers/agrenpaper_146.pdf

Deka, H, Kumar, A. 2009. *Making Modern Poultry Markets Work for the Poor*, Good Practice Brief, South Asia Pro-Poor Livestock Policy Program, FAO/NDDB, New Delhi
http://sapplpp.org/goodpractices/small-holder-poultry/SAGP03-making-modern-poultry-markets-work-for-the-poor/

Dolberg F. 2001. *A livestock development approach that contributes to poverty alleviation and widespread improvement of nutrition among the poor*, Livestock Research for Rural Development, Vol 13, No 5.

Dolberg, F. 2005. Emergency regional support for post-avian influenza rehabilitation. FAO Regional Office for Asia and the Pacific, Bangkok.

Dorji, T. undated. FAO report. Renewable Natural Resources Research Centre, Ministry of Agriculture, Jakar, Bumthang, Bhutan. http://www.raonline.ch/rao_btexplore01.html

East Africa Dairy Development Project (EADD) 2010. Some lessons learned. ILRI, Nairobi.

Efde, S. 1988. Final report of a practical training period in India. Wageningen, the Netherlands, Department of Tropical Animal Production, Agricultural University.

FAO, 2011. Asia's women in agriculture, environment and rural production, Rome.
http://www.fao.org/sd/wpdirect/WPre0108.htm

FAO, 2010. Agri-Gender Statistical Toolkit. Rome. http://www.fao.org/gender/agrigender/en/

FAO, 2010. Gender and Livestock. http://www.fao.org/gender/gender-home/gender-programme/gender-livestock/en

FAO, 2005. HIV/AIDS and the Livestock Sector. Rome. ftp://ftp.fao.org/docrep/fao/007/ae502e/ae502e07.pdf

FAO, 2003. Livestock Production Systems. Rome. ftp://ftp.fao.org/docrep/fao/003/x6624e/x6624e00.pdf

FAO, 1997. What is Gender? Produced by the Economic and Social Development Department. Rome.
http://www.fao.org/docrep/007/y5608e/y5608e01.htm

GALVmed, 2010. About GALVmed. http://galvmed.org/about-galvmed

GALVmed, 2011. April 2011 Newsletter.
http://www.galvmed.org/sites/default/files/GALVmed%20Newsletter%20-%20April%202011.pdf

Glendenning, C, Babu, S, Asenso-Okyere, K. 2010. Review of Agricultural Extension in India: *Are Farmers' Information Needs Being Met?* IFPRI. Washington, DC

Ghotge, N, Ramdas, S. 2002. *Women and livestock: Creating space and opportunities*. LEISA Magazine
http://www.leisa.info/index.php?url=show-blob-html.tpl&p[o_id]=12622&p[a_id]=211&p[a_seq]=1

GODHAN Project, Gender Action Plan, 2010. BAIF Development Research Foundation, India. Pune.

Grameen Bank, accessed 24 February, 2011. www.grameen-info.org

Gyaltsen, T, Bhattarai, B, 2000. *CATTLE MIGRATION SYSTEM OF WESTERN BHUTAN: A CASE STUDY*.

Hancock, J and Cho, G. 2008. *Assessment of likely impacts of avian influenza on rural poverty reduction in Asia: Responses, impacts and recommendations for IFAD strategy*. IFAD/FAO, Asia and the Pacific Service.
http://www.ifad.org/operations/projects/regions/pi/paper/6.pdf

Heffernan C, Misturelli F, Pilling D. 2003. *Livestock and the Poor: Findings from Kenya, India and Bolivia*.
Animal Health Programme, Department for International Development, London.
http://www.livestockdevelopment.org/adobedocs/livestockservicesandthepoor.pdf

Heifer International 2004. *Heifer Nepal Gender Case Study in Gender Mainstreaming in Action: Successful Innovations from Asia and the Pacific*. InterAction, Washington, DC. www.interaction.org

Herath S. 2007. *Women in livestock development in Asia*. Journal of Commonwealth Veterinary Association 24(1):29–37.

Hill, C. et al. 2009. Gender and Livestock in Gender and Agriculture Sourcebook. World Bank/FAO/IFAD. Washington, DC. http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTARD/EXTGENAGRLIVSOUBOOK/0,,menuPK:3817510~pagePK:64168427~piPK:64168435~theSitePK:3817359,00.html

Hill, C. 2003. *Gender Disaggregated Data for Agriculture and Rural Development: a guide for facilitators*. FAO/SEAGA. Rome. http://www.fao.org/sd/seaga/downloads/En/GDDEn.pdf

International Center for Research on Women (ICRW) 2011. http://www.icrw.org/files/images/Child-Marriage-Fact-Sheet-Around-the-World.pdf

ICIMOD, 1999. Strategies for Sustainable Management of Livestock in Mixed-Crop Livestock Farming Systems of the Hindu Kush-Himalayas: Trends and Sustainability. Katmandu. http://books.icimod.org/uploads/tmp/icimod_e2628a31bd5a26ff8f7c5490d6081706.pdf

International Fund for International Development (IFAD), 2004. *Livestock services and the poor: A global initiative collecting, coordinating and sharing experiences*. Rome. http://www.ifad.org/lrkm/book/english.pdf

IFAD, 2007. Bhutan. Rural Poverty Portal. Rome. http://www.ruralpovertyportal.org/web/guest/country/home/tags/bhutan

IFAD, 2009. Rural Poverty Portal. Rome. http://www.ruralpovertyportal.org/web/guest/country/home/tags/sri%20lanka

IFAD, 2010. Decision Tools for Rural Finance. Accessed 14 February 2011. http://www.ifad.org/ruralfinance/dt/index.htm

IFAD, 2010. Promoting women's leadership in farmers' and rural producers' organizations report. Rome. http://www.ifad.org/farmer/2010/agenda/e/report_women.pdf

Indhistory.com, accessed 12 May 2010. http://www.indhistory.com/india-caste-system.html

IndiaDairy.Com / All About the Buffalo. http://www.indiadairy.com/info_buffalo_milk.html

InterAction 2010. Gender Audit. http://www.interaction.org/sites/default/files/Gender%20Audit%20Handbook%202010%20Copy.pdf

Kabeer, N. *Gender Mainstreaming in Poverty Eradication and the Millennium Development Goals: A Handbook for Policy-makers and Other Stakeholders*. 2003. IDRC. Ottowa http://www.idrc.ca/openebooks/067-5/#page

Kanoubi, H. 2004. Report on dairy goat extension and human health linkages to reach women farmers in Ourzazate, Morocco. Heifer Internnational: Little Rock, AR

Kristjanson, P., Waters-Bayer, A., Johnson, N., Tipilda, A., Njuki, J., Baltenweck, I. 2010. Livestock and Women's Livelihoods: A Review of the Recent Evidence. Discussion Paper No. 20. ILRI, Nairobi http://mahider.ilri.org/bitstream/10568/3017/2/Discussion_Paper20.pdf

Kumar, N. and A. Quisumbing. 2010. *Does social capital build women's assets? The long-term impacts of group–based and individual dissemination of agricultural technology in Bangladesh*. CAPRi Working Paper No. 97. International Food Policy Research Institute: Washington, DC. http://dx.doi.org/10.2499/CAPRiWP97

Maarse, L. 2011. Personal communication.

Mahbub ul Hag Development Centre, 2003. http://www.mhhdc.org

Morgan, N, ed, 2009. *Models and opportunities for smallholder dairy producers in Asia: lessons learned*. FAO REGIONAL OFFICE FOR ASIA AND THE PACIFIC, Bangkok. http://www.fao.org/docrep/011/i0588e/I0588E12.htm

NDDB, 2011. National Dairy Development Board of India, Women's Dairy Cooperative Leadership Programme (WDCLP) http://www.nddb.coop/core_competencies/coop-wdclp.html

Narayanan, 1997. Cited in Asia's Women in Agriculture, Environment and Sustainable Production Program, in Sustainable Development Department, FAO, Rome. http://www.fao.org/sd/wpdirect/WPre0108.htm

Niamir-Fuller, M. 1994. *Women Livestock Managers in the Third World: A focus on technical issues related to gender roles in livestock production*. FAD, Rome. http://www.ifad.org/gender/thematic/livestock/live_toc.htm

Paudel L N, Meulen U, Wollny C, Dahal H and Gauly M 2009: *Gender aspects in livestock farming: pertinent issues for sustainable livestock development in Nepal.* Livestock Research for Rural Development. http://www.lrrd.org/lrrd21/3/paud21040.htm

Perry, B, and Grace, D. 2009. *The impacts of livestock diseases and their control on growth and development processes that are pro-poor.* In Philosophical Transactions of the Royal Society B, 364, 2643–2655 http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2865091/pdf/rstb20090097.pdf

Quisumbing, A, McClafferty, B. 2004. *Using Gender Research in Development.* IFPRI. Washington, DC. http://www.ifpri.org/sites/default/files/publications/sp2.pdf

Quisumbing, A, Pandolfelli, L. 2009. *Promising Approaches to Address the Needs of Poor Female Farmers: Resources, Constraints, and Interventions*, IFPRI Discussion Paper 00882. Washington, DC.

Ramalingaswami, V. Commentary: *The Asian Enigma in The Progress of Nations.* UNICEF, New York. 2006. http://www.unicef.org/pon96/nuenigma.htm#Professor

Ramdas, S. R. and S. Seethalakshmi (1999). *Between the Green Pastures and Beyond: An Analytical Study of Gender Issues in the Livestock Sector of Orissa*. Technical Reports, No. 21. Indo-Swiss Natural Resources Management Programme, Orissa, India.

Rahman, M., P. Sorensen, S. Askov Jensen and F. Dolberg (1997). *Exotic Hens under Semi-Scavenging Conditions in Bangladesh*. Livestock Research for Rural Development, 9, 3.

Rangnekar, D. V. and Rangnekar, S. (1997). *Traditional Poultry Production Systems and the Role of Women in Parts of Western India*. Second FAO Electronic Conference on Tropical Feeds.

Rangnekar, S, Vasiani, P and Rangnekar, DV. 1992. *A study on women in dairy production*. FAO, Rome. http://www.fao.org/docrep/t3080t/t3080T0m.htm

Rangnekar, S. (1998). *The Role of Women in Small-Holder Rainfed and Mixed Farming in India*. Proceedings of the workshop, 'Women in Agriculture and Modern Communication Technology', Danish Agricultural and Rural Development Advisers Forum, 30 March-3 April, Tune Landboskole, Denmark.

Rojas, 1994. Workshop report, *Particpatory Training in Gender Analysis for Heifer Project International.* Little Rock.

Roos, N., H. Nielsen and S. H. Thilsted (2002). *The impact of semi-scavenging poultry production on intake of animal foods in women and girls and Bangladesh*. Proceedings of the Global Livestock Collaborative Research Support Program-Sponsored Conference, Animal Source Foods and Nutrition in Developing Countries, Washington

Saleque, M, Paul,P, Rashid, H.. 2009. *Mitigating Diseases and Saving Valuable Assets: Poultry Vaccinators Delivering Services to doorstep of the Poorest in Bangladesh*. GoodPractice Note, SA PPLPP. New Delhi.

Seebens, H. 2010. Intra-household bargaining, gender roles in agriculture and how to promote welfare enhancing changes, in "Women in agriculture: closing the gender gap in development" in The State of Food and Agriculture 2010-2011, FAO Rome. http://www.fao.org/publications/sofa/en/

SIGI (Social Institutions and Gender Index) a project of OECD Development Centre, Göttingen University, and Erasmus University Rotterdam. Accessed 12/12/2010. http://genderindex.org/country/bhutan

Siddiquee, M, Southwood, R. 2010. *Integration of women in the Dairy Value Chain: The Strengthening the Dairy Value Chain (SDVC) in Bangladesh*, implemented by CARE-Bangladesh. Dhaka.

Schelling, E. 2007. *Human and Animal Vaccination Delivery to Remote Nomadic Families, Chad*. In Emerging Infectious iseases Vol. 13, No. 3. www.cdc.gov/eid

Shears P. 2000. *Communicable disease surveillance with limited resources: the scope to link human and veterinary programmes*. ACTA TROPICA Volume: 76, Issue: 1. http://www.cabdirect.org/abstracts/20002220898.html

Social Institutions and Gender Index (SIGI) 2009. Gender Equality and Social Institutions in Bhutan. http://www.genderindex.org/country/Bhutan

South Asia Pro Poor Livestock Policy Programme (SAPPLPP), 2011. Smallholder Poultry. http://sapplpp.org/thematicfocus/small-holder-poultry

SAPPLPP, accessed 12 May 2011. *Dead Birds or Shattered Hopes? A Study of the Impact of Bird Flu on Poor People's Poultry Related Livelihoods in West Bengal.* http://sapplpp.org/informationhub/doc019-dead-birds-or-shattered-hopes

SAPPLPP, 2009. SA PPLPP (2009) Code: BDGP01, *Mitigating Disease and Saving Valuable Assets: Poultry Vaccinators Delivering Services to doorstep of the Poorest in Bangladesh*. Good Practice Note, Delhi, India. http://sapplpp.org/goodpractices/small-holder-poultry/BDGP01-mitigating-diseases-and-saving-valuable-assets

Srinivas, M.N. 1952. *Religion and Society among the Coorgs in South Asia*. Oxford University Press, Oxford. http://books.google.com/books?id=SNw5zVN1V0oC&pg=PA436&lpg=PA436&dq=sanskritization+effect+india&source=bl&ots=j2ozkauVUp&sig=_UArSolNHgq5aMLx7fWuZwWMhzY&hl=en&ei=eIJpTcudJ5CCtgerwtHmAg&sa=X&oi=book_result&ct=result&resnum=4&ved=0CCoQ6AEwAw#v=onepage&q=sanskritization%20effect%20india&f=false

Stevens, A. 1990. *Women and Livestock Production in Asia and the South Pacific*. FAO/RAP. Bangkok.

Stewart, Susan. 1998. *Learning Together: the agricultural worker's participatory sourcebook*. Heifer International. Little Rock.

Svedberg, P. 2007. *Child Undernutrition in India and China*. IFPRI 2020 Focus Brief on the World's Poor and Hungry People. Washington DC: IFPRI. www.ifpri.org/2020Chinaconference/pdf/beijingbrief_Svedberg.pdf

Taylor, R. et al. 2001. *Risk factors for human disease emergence*. Philosophical Transactions of the Royal Society. London. http://rstb.royalsocietypublishing.org/content/356/1411/983.abstract?ijkey=020627870990101937b3db02ab7da1618eb2a3db&keytype2=tf_ipsecsha

Thapa, G. 2004. *Rural Poverty Reduction Strategy for South Asia*. IFAD. Rome. http://rspas.anu.edu.au/papers/asarc/2004_06.pdf

Thomas, Helen T., et al. 2010. Gender equality results in ADB projects: Sri Lanka country report. Mandaluyong City, Philippines: Asian Development Bank. http://www.adb.org/Documents/Books/Gender-Equality-Results/Sri-Lanka/ger-sri-lanka.pdf

Thomson, K. 2005. *Bolangir to Hyderabad and the politics of poverty: The choice of death in paradise or life in hell.* ActionAid International, New Delhi.

Tipilda, A., Kristjanson, P. 2008. *Women and Livestock Development: A Review of the Literature*, ILRI Innovation Works Discussion Paper, Nairobi.

Torres,M, Kunungo, P, Bhatnagar, S, and Dewan, A. 2001. *A Case Study on the National Dairy Development Board of India*. World Bank, Washington, DC.

UNAIDS, 2007. India profile http://www.unaids.org/en/regionscountries/countries/india/

UNICEF, 2011. Situation of India. http://www.unicef.org/india/hiv_aids_156.htm

Vögele, S. 2008. *The Troubling Quota: An Investigation on the Reservation of Council Seats for Women in India and its Possible Effect on the Hegemonic Discourse of Gender*. Licentiate Thesis, University of Basel.

Wangdi, K. RAonline. Accessed 12/12/2010. http://www.raonline.ch/pages/bt/peop/btpeop_layap01a.html http://www.raonline.ch/rao_btexplore01.html

Waters-Bayer, A, Letty, B. 2010. Chapter 3. *Promoting Gender Equality and Empowering Women through Livestock in The Role of Livestock in Developing Communities: Enhancing Multifunctionality*. South Africa. http://mahider.ilri.org/bitstream/10568/3003/1/roleLivestockFarming.pdf

Weiss, M. et al. 2008. *Gender and TB: socio-cultural aspects, in The International Journal of Tuberculosis and Lung Disease*. The Union. WHO, Geneva. http://apps.who.int/tdr/publications/journal-supplements/gender-and-tb/pdf/gender-and-tb.pdf

Woodford JD.2004. *Synergies between veterinarians and para-professionals in the public and private sectors: organizational and institutional relationships that facilitate the process of privatizing animal health services in developing countries*. Rev Sci Tech. 2004 Apr; 23(1). http://www.ncbi.nlm.nih.gov/pubmed/15200091

Wright, A. Deka, R, Thorpe, W, and Lapar, M. *The pig sector in North East India: status Constraints and opportunities.* ILRI: Nairobi. 2010

WHO/FAO/OIE. (2004). Report of the WHO/FAO/OIE Joint Consultation on Emerging Zoonotic Diseases. 3-5 May 2004, Geneva, Switzerland. Food and Agriculture Organization of the United Nations (FAO), World Health Organization (WHO), and World Organisation for Animal Health (OIE).

World Health Organization (WHO). 2006. *The control of neglected zoonotic diseases: a route to poverty alleviation*, Report of a Joint WHO/DFID-AHP Meeting with the participation of FAO and OIE Geneva http://www.who.int/zoonoses/Report_Sept06.pdf

WHO/HTM/NTD/2009. *Neglected tropical diseases, hidden successes, emerging opportunities.* http://whqlibdoc.who.int/publications/2009/9789241598705_eng.pdf

WHO 2009. Integrated Control of Neglected Zoonotic Diseases in Africa, Zoonoses and Veterinary Public Health, Department of Food Safety, Zoonoses, and Foodborne Diseases, Sustainable Development and Healthy Environments. Geneva. http://www.who.int/neglected_diseases/zoonoses/en/

World Bank, 2007. Sri Lanka Poverty Assessment Report: *Engendering Growth with Equity: Opportunities and Challenges.* Washington, DC http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2007/02/06/000020953_20070206094457/Rendered/PDF/365680LK.pdf

Contact GALVmed:

UK Office:
Doherty Building, Pentlands Science Park, Bush Loan, Edinburgh EH26 0PZ, UK

Tel: **+44 (0)131 445 6264**
Fax: **+44 (0)131 445 6222**
Email: **info@galvmed.org**

Africa Office:
1st Floor West Wing, A.K.D. House II, Fairgrounds, Plot 54478, Gaborone – Botswana
P.O. Box 45108, Gaborone

Tel: **+267 3121 202 / 203 / 209**
Email: **info@galvmed.org**

www.galvmed.org

Currently funded by:

BILL & MELINDA GATES foundation

UKaid from the Department for International Development

GALVmed

Protecting Livestock – Saving Human Life