Micro-livestock for Livelihoods: Meeting Practical and Strategic Needs of Women in Sunyani District, Ghana

by

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ABSTRACT

MICRO-LIVESTOCK FOR LIVELIHOODS: EXPLORING THE USE OF MICRO-LIVESTOCK FOR THE PROMOTION OF WOMEN’S LIVELIHOODS IN SUNYANI DISTRICT, GHANA

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This thesis investigates how capacity development techniques, including training and group formation, can be leveraged to aid in new livelihood development for women living in rural areas who lack the resources necessary for agricultural livelihoods: lack arable land, labour, and capital. This study is situated as a case in an agroforestry development project. The study used multiple qualitative methods to identify how these micro-livestock rearing activities contributed to women’s practical and strategic needs. Key informant interviews (n=5); in-depth interviews, including ranking and scoring exercises, with beneficiaries (n=16); and participant observation all contributed to an in-depth understanding of the relevant phenomena. Interviews were coded and analyzed for key themes that emerged. The study focuses on how micro-livestock as a development intervention may contribute to increased capacities of women in the communities. The conclusions emphasize the importance of fostering knowledge exchange amongst beneficiaries for the maximization of tangible and intangible benefits.
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CHAPTER ONE
INTRODUCTION

Overview of the Topic
More than 20 years have passed since gender specialist Carolyn Moser first introduced a set of gender analysis tools to help those designing the implementation of development interventions in the Global South. These tools were aimed to evaluate how an intervention was contributing to the women’s triple role and their practical and strategic needs. The framework took into consideration that the availability of resources (land, labour, capital, and knowledge) to ensure that women had the means necessary to participate in new development initiatives. Despite this, projects are often designed and implemented without fully understanding the potential for the intervention to help women develop sustainable livelihoods that are necessary for the alleviation of poverty. This lack of consideration often leads projects to be inaccessible to women, and therefore irrelevant to them. Moser’s work demonstrated that using gender analysis tools in the planning, implementation, monitoring and evaluation stages of a development initiative are integral to understanding the complex social, cultural, economic, and environmental factors that may inhibit women from fully participating in helping a community to become more self-sufficient and resource-secure. Simultaneously, planning for women’s participation does, in fact, improve the likelihood that women will participate and be positively impacted.

In development planning today, gender analysis tools for the inclusion of women are still needed and relevant. This study sheds light into how the use of these tools can be beneficial in engaging women in development projects, but also highlights areas of improvement in terms of resource access, training, and managing intra-household decision-making dynamics. The study illustrates this by examining the micro-livestock component of the Agroforestry Practices for Enhanced Rural Livelihoods (APERL) development project as a case in which men and women were to be equally engaged.
The APERL development project is funded by the Canadian International Development Agency (CIDA), and defined as a Tier 2 project with a focus on University Partnerships. In this project, the partnership exists between the University of Guelph (UoG), and the Kwame Nkrumah University of Science and Technology (KNUST). KNUST’s Faculty of Forest Resource Technology (FFRT), is responsible for the implementation of project goals and objectives which include enhancing the livelihoods of the resource poor through agroforestry technologies to help improve soil fertility, increase food security, and by providing new income generating opportunities (APERL, 2008). Agroforestry technologies utilized within the project included the integration of economically viable wood species and fruit trees into already existing farm systems, the supply of high yielding plant materials, infrastructure for improved fuelwood efficiency, and the distribution of livestock among others. The communities involved in the APERL project, at the time of the study, included Fiapre, Dumesua, and Ayakomaso in the Sunyani Municipality of the Brong-Ahafo Region, Ghana.

Integrating micro-livestock into tropical (e.g rainforest; semi deciduous rain forest; dry deciduous forest; spiny forest; savannah etc.) agroforestry projects (sometimes referred to as agrosilvopastoralism) for the resource poor, can provide many direct and indirect benefits to ecosystem function, the sustainability of rural livelihoods and food security (Bohringer, 2001; Devendra, 2004; APERL, 2008). Literature supports that adding livestock into mixed farming systems can help to meet the above objectives, and are vital in alleviating poverty of the rural poor (Bohringer, 2001; Devendra, 2004). However, crop-animal interactions are complex and the impacts of animal integration into agroforestry projects will vary within different socio-economic and agro-ecological environments.

In order for the addition of livestock into mixed farming systems to be sustainable, practices must:

(i) ...not have adverse effects on the environment... (ii) ...[be] accessible to, and effective for farmers, and (iii) lead to both improvements in food productivity [while simultaneously having] positive side effects on environmental goods and services (Pretty, 2008 p. 447).
Incorporating livestock into mixed farming systems is a form of agricultural intensification. This type of intensification is needed if food demands continue to increase simultaneously with increasingly marginal land and population growth. The value added to farm systems by integrating livestock into agroforestry practices can be referred to as ‘sustainable intensification’ if it is carried out in a way that enables more food to be produced in the same area of land while reducing negative environmental impacts (Godfray et al., 2010). The rearing of micro-livestock has the potential to meet the criteria of sustainable farming practices, while simultaneously addressing food security and livelihood diversification (Lenne et al., 2003) if benefits of and barriers to doing so are well understood.

Within farming systems in rural areas of Sub-Saharan Africa, women are predominantly responsible for nutrition at the household level, making it likely that competition over the services and resources associated with micro-livestock may occur. Ensuring food availability for the household is an example of a practical gender need (as defined by Moser, 1989). Furthermore, if women are engaging in the trade or selling of livestock products and by-products, then livestock can serve a strategic gender need – creating employment that is often undertaken by men and enabling women to earn money while at home or close to home. By addressing women’s strategic needs, autonomy can be improved which can lead to better decision-making power and the more equitable distribution of resources (Moser, 1989).

By identifying and discussing strategic needs within their communities, women can become equipped with the knowledge that others share similar goals and aspirations and may be able to collectively pursue mutual interests. Additionally, by recognizing these needs within the context of the APERL development project, policy makers are better equipped to plan capacity development activities. By understanding needs and opportunities in relation to a tangible and highly valued livelihood opportunity – micro-livestock rearing – the project can better allocate resources to maximize the social
and economic benefits of an already existing investment. Furthermore, as micro-livestock rearing is a livelihood already practiced in the Region, the study does not propose the introduction of new activities but look for leverage for ways to make the impacts of the practice more profound and effective in meeting short-term and long-term goals (Sharp et al., 2003). The research emphasizes women’s collaboration in doing so, allowing for the recognition and development of current and desired capabilities.

This study seeks to understand the potential for micro-livestock to contribute to gender needs within the context of the APERL Project. The three initial project communities are included in the study: Fiapre, Dumesua, and Ayakomaso. These communities are situated within the Sunyani Municipality of the Brong-Ahafo Region of Ghana.

**Research Rationale**

The baseline study completed by the APERL project team in 2008 indicated that over 90% of participants had an interest in rearing micro-livestock. This was an interesting finding as the initial project did not intend to incorporate micro-livestock as an agroforestry tool. However, in response to the high level of interest, the project directors decided to incorporate a micro-livestock component in the project. By establishing a partnership with the Ministry of Food and Agriculture (MOFA) Wenchi Training Institute, APERL was able to combine animal husbandry training with the distribution of sheep, goats, pigs, and grasscutters. Men and women were targeted equally by this component of the project. However, since the implementation of the training and distribution of the animals, no follow up on the success and impact of the animal rearing project had been done. The baseline study also recommended that opportunities for further micro-livestock development be investigated. Furthermore, in a study conducted by Wright (2011), the significant role of micro-livestock in the project was highlighted and a call for further analysis of this intervention was called for. Of particular interest is whether this ‘equality’ approach to animal distribution was in fact having a positive impact on women participants.
More broadly, the study fulfills the need for research into alleviating food insecurity in the Global South, as it is anticipated that food shortages will increase as rural communities become more urbanized. As a result of this urbanization, diets that traditionally did not contain a lot of animal proteins are expected to change. Demand for animal protein is expected to increase rapidly. At the same time, communities experiencing land use change are often observing decreased soil productivity associated with farming small plots of marginalized land. Accessible and sustainable solutions to food security and opportunities for livelihood diversification are needed to address these issues. Community interest in micro-livestock rearing within the context of the APERL project has grown considerably and is often cited to be of primary interest to beneficiaries opposed to agroforestry practices (Afra, 2011). This is due to micro-livestock’s immediate benefits and lack of long term investment in comparison to the growth of fruit trees. While investment in both agroforestry and livestock rearing is necessary for a holistic approach to improving the sustainability of agriculture and maintaining natural resource systems, it is necessary to further examine where the beneficiaries interests lie.

In particular, how gender roles differ in the production of micro-livestock within the Region is not well understood. Less clear, are the opportunities for micro-livestock to contribute to the practical and strategic gender needs of women at the household and community levels. Understanding the needs of women at the household level within mixed farming systems incorporating micro-livestock should help to create more sustainable and accessible development initiatives in the future.

**Research Goal**

- To understand the potential for micro-livestock to contribute to practical and strategic gender needs of women within the context of an agroforestry project in the Brong-Ahafo Region of Ghana.

**Research Objectives**

- To document the practical and strategic gender needs of women rearing micro-livestock within the project communities.
• To identify the contributions that micro-livestock livelihoods make to satisfying practical and strategic gender needs of women.
• To determine how livelihood training contributed to current capacities of women within the project communities.

Limitations
Limitations of the study, including limitations of the methodological approach, are discussed at length in Chapter Three.

Significance of the Study
Development organizations commonly require ‘gender mainstreaming’ as a stipulation on reporting of development activities. However, the extent to which gender considerations are made from the project planning phase throughout the project to monitoring and evaluation often is not completed in a way that truly addresses issues of equality, equity, and empowerment. Understanding the impacts of the inclusion of women in case studies in which women have been equally targeted to men by an intervention is necessary in order to continue to inspire project directors to thoughtfully plan for the inclusion of marginalized groups. This study is unique because it combines gender analysis tools with an intervention that is not commonly represented in the literature but seemingly addresses a number of pressing development concerns including: sustainable agricultural intensification; food security; income generation; livelihood development; capacity development; and knowledge transfer and translation.

Literature on micro-livestock as a development tool is scarce, and its role in rural innovation and sustainability needs still to be explored. Furthermore, as an intervention tool for women, there is still much to be written. The study has the potential to guide APERL’s further implementation of micro-livestock related decisions, in terms of understanding its significance for women and the resources that are abundant or scarce that are needed for the long-term sustainability of its impacts. More significantly, the results can be used to inform other livestock development initiatives in the region. In
particular, it is hoped that interventions that are accessible and inclusive of the needs and roles of women can be designed by using lessons learned from this study.

**Overview of the Thesis**
This thesis is divided into six chapters. Chapter Two reviews relevant literature on capacity building, innovation in agriculture, gender in development, micro-livestock, and intra-household decision-making.

This chapter discusses the conceptual framework based on Moser’s (1989) gender analysis tools, and highlights the interconnectedness of the above bodies of literature. Chapter Three discusses the research epistemology and the methodological approach, along with the qualitative research methods employed. Chapter Four contains the findings of the thesis research by presenting and analyzing data as collected through the research methods. Quotes from beneficiaries, photographs from the field, and the use of charts and graphs to illustrate trends in responses are all used to express the qualitative detail of data gathered. Chapter Five discusses the main themes from the findings, situated within the relevant literature and the conceptual framework in order to draw meaning from the data presented. Last, Chapter Six uses the discussion to make conclusions and recommendations for APERL, future micro-livestock development interventions, and for further research.
CHAPTER TWO

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

Introduction

Issues of poverty, food insecurity, resource depletion, and land degradation are interrelated problems, requiring an interdisciplinary approach to understanding their cause and effect. For this reason, literature in both the natural and social sciences must be considered in observing the interactions of the various factors contributing to the need for livelihood diversification in the Sunyani District of Ghana.

The relevant literature review of this study focuses on research related to capacity development, gender, micro-livestock, farming systems, and intra-household decision-making. A holistic approach was taken in understanding the interrelationships between capacity development, agroforestry, and gender to enable livelihood diversification amongst the rural poor, with a focus on women. The types of literature chosen are necessary in framing the research and ensuring a strong foundation in concepts relating to gender and rural livelihood development. Capacity development literature is particularly essential to the study as knowledge transfer plays an essential role in not only the APERL project but also in the success and sustainability of micro-livestock livelihoods.

Understanding how the concept of gender in development has evolved over time is important in analyzing current development initiatives aimed at improving the capacities of those most marginalized in communities, typically women in patriarchal societies. Agroforestry practices are central to the Project, and their use and purpose are vital to understanding rural and peri-urban environments. The following literature is presented in three main sections detailing Capacity Development, Gender and Development, Agroforestry for Development, Gender and Decision Making, and Innovation in Agriculture.
Capacity Development

Within the field of international development improving human, institutional and local capacities has been recognized as necessary to improve livelihoods, reduce poverty and achieve the sustainable transformation of human practices (Hope, 2011). Capacities can be understood as:

...abilities, skills, understandings, attitudes, values, relationships, behaviours, motivations, resources and conditions that enable individuals, organizations, networks/sectors and broader social systems to carry out functions and achieve their development objectives over time (CIDA, 2000, p.2).

Capacity development (CD) can be defined as: “enhancement of the competency of individuals, institutions, and local communities to engage in activities in a sustainable manner for positive development” (CIDA, 2000 p.2; Hope, 2011).

CD comes from a systems theory approach for understanding human capability and the institutions in which action and change take place (CIDA, 2000; Morgan, 2005; Brinkerhoff and Morgan, 2010; Hope, 2011). It acknowledges that change is non-linear and involves complex interactions of individuals with other people in environments of varying levels of predictability (Brinkerhoff and Morgan, 2010). In contrast to linear paradigms, systems theory recognizes science and technology as highly influenced and dependent on the social, cultural, political, historical and institutional context (World Bank, 2007). These systems, processes of adaptation, change, and transformation can all occur over time (Brinkerhoff and Morgan, 2010). A systems thinking approach focuses on patterns, processes and relationships. It is interested in the impacts of these interactions, not in predicting the outcomes (Morgan, 2005). Another characteristic of systems thinking is that it recognizes that knowledge of these complex systems cannot be objective and that phenomena are highly dependent on context (Morgan, 2005).

The theory supports the idea that the reality of a system changes based on who is looking at it, how it is observed and for what reasons (Morgan, 2005). As a result, understanding human capability
and institutional change can only be obtained by incorporating different perspectives using different tools (Morgan, 2005). Situating CD within systems theory emphasizes the need for holistic approaches to development, agriculture and understanding gender roles. It is inclusive of local knowledge and context when constructing meaning and understanding interconnected events. This approach inherently acknowledges differing ways of understanding and behaving and therefore is inclusive and highly reliant on the use of qualitative methods in CD research.

In the past, capacity development was defined as education and training for individuals with an emphasis on improving institutions within the private and public sectors (Hope, 2011). In recent years, the process of successful CD has proven to be much more dynamic, incorporating networking, the creation of enabling environments, the development of legal frameworks and policies, the construction of action plans, the supporting the societal goals of civil organizations (Hope, 2011) and the nurturing of innovation processes. Innovation processes can be understood as a “...set of interrelated agents, their interactions, and the institutions that condition their behaviour with respect to the common objective of generating, diffusing, and utilizing knowledge and/or technology.” (Kristjanson, 2010 p. 39).

Innovation processes are of particular interest within the CD approach, as research shows that innovation is a key component of empowerment within individuals, communities, and institutions allowing a sense of ownership, capability, and transformation. Innovation within natural resource management (NRM) and agricultural is reliant on the integration of three systems: technological systems, social systems and biophysical systems (Pant and Hambly-Odame, 2009). Literature that focuses on the empowerment of underrepresented genders encourages the sentiment that empowerment is a multi-tiered process that is necessary for these groups to recognize their role in the development process. (Khan and Bibi, 2011). For women in the developing world, some of the vital components necessary for realized capacity are:

(a) Ability to organize into groups
(b) Reduction in productive and/or reproductive workload.
(c) Ability to participate in economic activities.
(d) Ability to access financial and economic institutions.
(e) Ability to make decisions about spending their income (Khan and Bibi, 2011)

When addressing issues of CD, it is important to recognize that four levels in which CD can take place are generally accepted. These levels are: the individual, the organization, the sector/network, and the enabling environment (See Figure 1) (CIDA, 2000).

A recent study by Brinkerhoff and Morgan (2010) found through the analysis of development case studies that CD primarily incorporates five capabilities to be improved in order to support the environment for meaningful change. These capabilities were listed as follows:

1. The capability to commit and engage
2. The capability to carry out technical, service delivery and logistical tasks
3. The capability to relate and attract support.
4. The capability to adapt and self-renew
5. The capability to balance diversity and coherence (Brinkerhoff and Morgan, 2010)

Figure 2.1 Capacity Development Conceptual Framework (CIDA, 2000)
Innovation in Agriculture

Innovation is considered to be a central theme in capacity development literature. As a result, innovation literature is a particularly relevant discipline to this study, and adds depth to understanding how resource-poor individuals subsisting on natural resource based livelihoods adapt to changing rural environments. For the purpose of this study, innovators can be understood as the first users of a technology (Diederen et al. 2003). This literature should be examined in relation to engagement of beneficiaries in non-traditional livestock rearing, as well for understanding the behaviour of those participants who chose to rear traditional livestock types. Innovation systems theory has evolved from the field of manufacturing literature, capacity development literature (Hambly et al., 2007). In rural development literature, it has been discussed that resource-poor farmers have limited ability to make new choices as they face high levels of uncertainty, high levels of risk, and are particularly vulnerable (The World Bank, 2006).

Diederen et al. (2003) discusses some of the structural reasons that a farmer may choose to be a ‘first-user’ and ‘early-adopter’ a ‘laggard’ or a non-adopter which can be related to farm size, resource access, and ability to access information. Information on these types of ‘users’ is important when trying to understand the motivations of individuals for choosing animal species types, and the likelihood that they will engage in animal by-product diversification. ‘Innovative ability’ was beginning to be explored in the 1980’s which attempted to determine what motivated individuals to learn about new technologies. It was hypothesized and found by Wozniak (1984) that education, experience, and the availability of information will contribute to the adoption of a new technology but not necessarily its diffusion. These notions are later explored in NRM literature, where Hambly-Odame and Pant (2009) found that expert knowledge and reliable knowledge transfer systems are vital to the uptake of new technologies, and to support innovation systems. For resource-poor individuals rearing livestock, it has been recently found that social and cultural norms may influence ‘first-user’ behaviour, or a reluctance to innovate, more
than economic drivers (Heffernan, Thomson, Neilson, 2008). Additionally, Heffernan, Thomson, and Neilson (2008) found that membership in a group can aid in helping resource-poor individuals adapt and be receptive to new technologies. These findings are important when designing interventions aimed at building capacity for individuals within communities.

How the concepts central to capacity development and literature on innovation in agriculture can be applied to development interventions with specific gender objectives can be better understood by understanding the history of incorporating gender into development initiatives. The next section of the literature review will define gender, discuss the history of gender in development, outline some tools, and emphasis relevant literature on the subject.

**Gender and Development**

Gender is the term used to describe differing roles and responsibilities of an individual in relation to their biological sex. Gender can be understood as the social relationship between two sexes that results in different societal roles and expectations (Brumer, 2008). The roles and responsibilities that stem from these social relationships vary substantially depending on the culture in which they are situated. Culture can be defined as: “The distinctive patterns of ideas, beliefs, and norms which characterize the way of life and relations of a society or group within a society” (Reeves and Baden, 2000, p.2). Because of the cultural nature of gender, the concept is always changing over time and space (Brumer, 2008).

Gender is an inherent component of all social relationships (Cornwall, 2003). Gender, as a term in development, has been used to highlight how these differences impact a person’s ability to access resources, services and opportunities. Decision-making power, income allocation, education opportunities, hierarchical status and access to social networks are all components of daily life to which the analysis of gender has been applied (Brumer, 2008). In the development literature, incorporating
gender as a concept into the understanding of planning and development issues has seen many varying approaches.

Traditionally, many international development organizations have been known to take a patriarchal approach to development initiatives; seeing the extraction of resources from the natural environment, the unbridled use of technology to improve “efficiency,” and ultimately, men’s interests as the most effective components of good development work internationally and nationally (Kettel, 1993). As a result, the conservation of nature’s goods and services, and the protection of women’s priorities were often overlooked (Kettel, 1993). A number of theories were developed in response to these trends, including radical ecofeminism, and social feminism (Kettel, 1993). Both of these counter-approaches to conventional development have some flaws which are largely based on their tendency to alienate men or women that do not recognize the same gender roles as defined by the theories. Furthermore, they lack the sustenance necessary to be used as an analysis tool (Kettel, 1993). However, they raise key issues that should be raised in all development initiatives with the goal of giving women power as decision makers, and ensuring that projects are benefiting women’s personal interests as well those of men (Kettel, 1993). These points include the need for emphasis on women’s lives; recognition of women’s special role in reproduction; the exploration of cultural and spiritual causes for behaviour; the platform for the expression of these experiences; and in the acknowledgement that statism, capitalism and racism all inherently influence the way development is carried out (Kettel, 1993).

In addition to how development organizations have understood women’s position in reproductive and productive roles, their measure of women’s well-being has also evolved in interesting and relevant ways. Much of the research conducted prior to the 1990’s, focused on women’s well-being only in terms of their health as it related to their reproductive role. However, around this same time, a movement to recognize women’s well-being in a more holistic way was developed. It was argued that in order to fully understand a women’s health status, their involvement in decision-making roles, the
amount of monetary autonomy they possessed, and their ability to access leisure time must all be measured and understood qualitatively (Kettel, 1996). Additionally, women’s level of literacy, the availability of supporting networks, access to medical care, nutritional and caloric intake, and appropriate housing have all been shown to affect women’s overall well-being and are often neglected in situations where a woman lacks the socio-economic power to negotiate these rights for herself (Kettel, 1996). This multi-faceted approach to understanding women’s needs separate from, but existing within, both their families and in their communities later contributed to the much needed, liberal, approaches to including women in development processes.

Women in Development (WID) is a liberal feminist development theory that first became popular in the 1970’s (Razavi and Miller, 1995). It was preceded by work done by Ester Boserup on women’s influential roles in economic development. Boserup discussed how women contribute to both the social and economic wellbeing of communities in sub-Saharan Africa. As WID theory emerged, it aimed to involve women in already existing structures and institutions within societies (Cornwall, 2003) with an emphasis on women’s productive roles opposed to their social welfare or reproductive concerns (Razavi and Miller 1995). WID focuses on two main approaches of including women in development initiatives: efficiency and equity (Razavi and Miller, 1995).

Since the initial development of WID theory, more approaches have been identified within the literature. Each of these approaches has its own assumptions and prescriptions. The fivefold schema developed by Moser (1993) includes the equity approach; the welfare approach, the anti-poverty approach; the efficiency approach, and the empowerment approach.

As gender as a concept in development gained more attention, the WID approach was criticized by many organizations, academics, and stakeholders. The framework was criticized for not attempting to change those parts of systems and institutions that inherently limited the opportunity for women’s participation (Cornwall, 2003). It was argued that the societal and structural basis on which women
were excluded from decision-making processes had to be addressed before any kind of sustainable movement on women’s empowerment could be accomplished (Cornwall, 2003).

In response to these inadequacies, the Gender and Development (GAD) framework was created. This new approach to feminism and development was started in 1977 during ‘The Subordination of Women’ Workshop (Ravazi and Miller, 1995). Out of this workshop came a publication titled “Of Marriage and the Market” by Ann Whitehead and Lourdes Beneria (Ravazi and Miller, 1995). This paper was critical of WID for accepting currently existing structures and processes without questioning how these institutions in and of themselves play a vital role in the creation of gender identities – including the limitations of these gendered roles. GAD attempts to tackle issues of structural, inter-subjective and personal power (Cornwall, 2003). The long term goal of GAD is empowerment (Sharp et al., 2003).

GAD tends to have a more radical set of goals, in comparison to WID, and recognizes women’s empowerment as an intrinsically valuable process. The focus on ‘empowerment’ makes the concept of ‘power’ central to the framework. Power can be understood in a number of ways including, ‘power over,’ ‘power to,’ and ‘power from within’ (Sharp et al., 2003). Power over, within the development and gender context, often refers to the idea that women should be enabled to gain power over men by accessing political and economic decision-making opportunities (Sharp et al., 2003). Conversely, ‘power to’ does not value women’s advantage over men’s disadvantage – It envisions that the empowerment of women will benefit the whole of a community (Sharp et al., 2003). ‘Power from within’ understands empowerment as women feeling competent in articulating and acting on causes that they feel strongly about (Sharp et al., 2003).

GAD also emphasizes that the participation of some women within institutional structures is not representative of all women (Cornwall, 2003). It is true that some women gain power at the expense of other women and that those already powerful women can exploit opportunities to further advance their own interests. GAD is cognizant of the reality that many men are marginalized from structures of power
and systems of decision-making in a similar way and that the interests of the most powerful men are often represented (Sharp et al., 2003).

To account for these similarities between genders, the GAD framework acknowledges that the differences between men and women are largely socially constructed (Reeves and Baden, 2000). As a result, current gender roles and relationships can be challenged and changed (Reeves and Baden, 2000). GAD research recognizes that relationships between men and women are in some sense negotiated. This is sometimes referred to as “patriarchal bargains” and can be used to explain why women are often reluctant to engage in initiatives that may change their current socio-economic status (Sharp et al., 2003). Women have been found to be afraid of losing the power or benefits associated with their already existing gender roles (Sharp et al., 2003)

In agriculture, the gendered division of labour is an important component of understanding the interactions within farm systems between men and women. The gendered division of labour is largely reliant on the separation of roles and responsibilities that are deemed appropriate for men or women within a given culture (Reeves and Baden, 2000). These roles are often negotiated within the household. Within the context of labour, ‘maleness’ and ‘femaleness’ are often dismissed as inherent qualities of biological sex instead of the result of socialization and cultural expectation (Razavi and Miller, 1995). Despite this, the gendered division of labour can also refer to the sharing of responsibilities in a household. For example, in many households the preparation of meals or completion of daily household upkeep can be shared by both male and female partners. In lieu of this sharing of responsibilities, research has found that it is common for men to under-represent the contributions of their female partners in agricultural work (Neupane, 2002).

The gendered division of labour is very much connected to the division of the private and public domain (Sharp, et al., 2003). The private and public domain of gendered roles can vary substantially (Cornwall, 2003). This refers to the reality that what may be appropriate for a male or female inside of
the household, may not be appropriate behaviour outside of the household (Cornwall, 2003). This further complicates the responsibilities and decision-making roles of each gender and may lead to confusion when attempting to understand the negotiation of tasks within a household. Recognizing the contextual nature of male and female relationships in respect to the division of labour is essential in understanding how gender needs differ across cultures and over time.

Given the APERL project’s goal to engage both women and men in income-generation activities through the employment of agroforestry tools, it’s important not to only understand the role of gender in development interventions but also how agroforestry has been used as a tool to alleviate poverty and generate income. The next section defines agroforestry, discusses some of the tools used in agroforestry projects, and discusses relevant literature.

**Agroforestry for Development**

Agroforestry is a method of farming food crops that combines food crops with trees. It can include alley cropping or intercropping techniques and/or silvopasture (Gyasi *et al.*, 2004). It is the intentional use of biologically enriching woody species to improve crop production that makes agroforestry distinct from other farming types (Agbo, 1999). A vast amount of literature exists on the different adaptations of this farming system, indicating its suitability to a wide variety of agro-ecosystems.

Agroforestry is often used to meet the objectives of diversifying the agricultural production base, enhancing productivity of the farming system, increasing soil fertility and preserving biodiversity within the system (Agbo, 1999; Bohringer, 2001; Devendra, 2004). Other goals and objectives can be associated with the use of agroforestry, such as the slowing of deforestation. This type of farming system is largely used by small-scale farmers and is an appropriate approach to addressing issues of food security and livelihood diversification (Agbo, 1999; APERL, 2008).
Despite the variety of benefits associated with agroforestry practices, these farming systems often face challenges characteristic of other types of systems – pests, poor soil productivity, and variance in yield.

Many examples of the use of this farming system to address food insecurity, poverty alleviation, and to diversify livelihoods exist. Literature on these projects largely focuses on the added ecosystem function of trees in crops e.g. carbon sinks; improved soil fertility; reduced erosion; fuel source; timber source etc. (DeFries and Rosenzweig, 2010.) Because of this, the prioritization of small animals for short-term economic and household benefits in agroforestry is often overlooked.

**Defining Micro-livestock**

Since the term ‘micro-livestock’ was coined in 1991 by the Board on Science and Technology for International Development (BOSTID), very little empirical research has been published exploring the roles and opportunities of these smaller types of livestock in agriculture or livelihood development. Research published on micro-breeds and small species of sheep, goats, and pigs rarely differentiates the livestock type as unique from conventional livestock. Furthermore, research conducted on opportunities for rodent’s (e.g. grasscutters) in livestock production may recognize the species’ smallness as desirable but not much literature exists acknowledging rodents as part of a broader compilation of small animals i.e. micro-livestock. Research using the term primarily explores the potential for insects as a main protein source. It should be noted, however, that insects were not included in the original research document as a type of ‘micro-livestock.’ Other terms used to denote ‘micro-livestock’ are ‘mini-livestock’ or ‘small stock’ and can be used interchangeably to refer to all types of ‘micro-livestock.’

Micro-livestock (mini-livestock and small stock) can be differentiated from conventional livestock in one of two main ways. The first category is micro-livestock that may be a ‘micro-breed’ of larger conventional livestock, or it may be a small species of a traditionally favoured type of livestock (BOSTID, 1991). The second category may be an animal that is inherently small by nature. For this study, micro-livestock refers to goats, sheep, domesticated pigs, and grasscutters (BOSTID, 1991). These four
types of ‘micro-livestock’ fall into two larger categories: ‘micro-breeds’ (small breeds of conventional livestock) and ‘rodents’ that are small by nature. Other categories included in the document published by BOSTID, but not explored in this study include: micro-cattle, poultry, rabbits, rodents other than grasscutters, deer and antelopes, lizards, and bees (BOSTID, 1991).

The APERL project also explored the potential for guinea fowl and chickens (poultry), domesticated rabbits, bee keeping, and snail production which all could be included under the umbrella of ‘micro-livestock.’ However, the APERL baseline survey indicated that poultry were easily acquired and kept by a majority of potential beneficiaries, and that there was not significant interest in the other types of micro-livestock. As a result of the above, for this study, ‘micro-livestock’ is defined as micro-breeds (less than half the size of most common breeds) of conventional livestock (i.e. sheep, goats, pigs) and native, domesticated or semi-domesticated, rodents (i.e. grasscutters).

The Role of Micro-Livestock

The potential for micro-livestock to help diversify rural livelihoods is believed by the Board of Science and Technology for International Development to be substantial. Despite this, and the document produced from the Panel on Micro-livestock by the BOSTID in 1991, very little research has been done to document the benefits that come from these breeds. This original document is still the most comprehensive resource for understanding the breeds, impacts, and opportunities for micro-livestock in international development. As a result, the section below is derived primarily from this resource.

Micro-livestock have a host of benefits and opportunities that conventional livestock do not present for subsistence farmers and other resource-poor individuals in rural communities. In particular, those individuals that lack arable land, labour and capital are not well suited to maintain large, expensive conventional livestock on increasingly marginal land. In fact, many rural areas are becoming increasingly urbanized, placing more pressure on available farm land and land that can be used for grazing and pasture (BOSTID, 1991). It is argued that the smaller the animal, the more likely it will be
kept close to home where it will be used for the benefit of the family (BOSTID, 1991). In this way, it is expected that by encouraging the production of micro-livestock at the household level, deficiencies in protein intake can be managed (BOSTID, 1991). Furthermore, having a diverse range of activities in which to draw an income is also essential to the vitality of rural households. Micro-livestock is believed to present an opportunity in which by-products, breeding stock, meat products and other intangibles (e.g. increased knowledge of animal husbandry) can be exchanged for cash or in-kind (BOSTID, 1991).

The main benefits of micro-livestock can be divided into a few categories: economic and reproductive, feed, and adaptability (BOSTID, 1991). The economic benefits of micro-livestock are multifaceted. Micro-livestock tends to be comparatively inexpensive to buy, in comparison to conventional livestock, making it more realistic that a subsistence farmer would be able to invest in and sustain a group of reproductive micro-livestock (as compared to conventional types) (BOSTID, 1991). As a result, micro-livestock are less financially risky. It is more plausible that a resource-poor farmer would be able to buy and manage a few small animals more successfully than raising one large animal (BOSTID, 1991). By having more than one animal at a time, the farmer’s investment is protected from unexpected death or illness. In this way, the herd is considered to be more adaptable as it allows the investor to manage the size of the herd based on their reproductive rates and the demand for animal products (BOSTID, 1991). Larger numbers also increase the likelihood that the farmer will be able to successfully breed livestock, allowing meat products to be available consistently throughout the year, and sustaining the livelihood over the long term. Micro-livestock tend to breed more quickly and reach sexual maturity at a younger age than large animals. They have shorter gestation periods, and give birth in higher numbers. High reproduction rates are useful in ensuring both the sustainability of the investment, and for income generation. A farmer could sell excess offspring, breeding stock, or use older animals for home consumption. Alternatively, due to their small size, the investor could increase the number of animals held at a given time without necessarily needing large amounts of extra land, and sell the animals when
deemed most beneficial, providing a steadier source of income. Other benefits related to the economic well-being of the farmer include: reduced spoilage of meat when killed for food and; smaller, more basic facilities required for raising and breeding (BOSTID, 1991).

In terms of feed, micro-livestock can largely be raised on waste discarded by humans e.g. fibrous residues, industry by-products, and kitchen wastes (such as vegetable and tuber peels). Micro-livestock also tend to favour minute feeds that may otherwise go unused, or grasses and leaves not eaten by cattle. This leads to a more efficient use of forage resources and often requires that less land is needed to sustain micro-livestock than a conventional animal (BOSTID, 1991). This advantage is particularly important in areas that experience dry-periods and other extreme climatic events where the availability of grass becomes scarce (BOSTID, 1991). However, it is important to note that small animals require proportionately higher amounts of feed and grow proportionately faster (BOSTID, 1991). However, this is not always a constraint as micro-livestock are typically able to feed from a wide variety of sources (BOSTID, 1991).

Smallness is often an adaptation to harsh environments which makes micro-livestock well suited to environmental niches, and areas with fluctuations in temperature or harsh climates. Smallness can be a result of traditionally scavenging for food and living in disease-prone climates, resulting in breeds that have naturally high levels of adaptability and robustness (BOSTID, 1991).

Despite the numerous advantages of micro-livestock, there are disadvantages as well. It is important to be aware of these disadvantages in order to mitigate any constraints small animal rearing may have on the investor. Disadvantages include high energy requirements, increased labour requirements, disease, predation, lack of research, and human resistance to new and small species (BOSTID, 1991).

Small animals that are not ruminants tend to have higher feeding requirements per unit of body weight than larger species, which is caused by biological restraints on efficiency of food digestion
(BOSTID, 1991). As a result, small animals tend to require food that is higher in protein, with less fibre (BOSTID, 1991). This discrepancy is most notable when comparing small non-ruminants to large ruminants (BOSTID, 1991)

Individual decisions made about animal husbandry and how micro-livestock are to be kept and fed can largely impact how labour-intensive their care will be (BOSTID, 1991). However, small animals kept in cages require daily care and regular feeding as they are not able to forage for themselves. This can be seen as a burdensome requirement and less desirable than free-range livestock typically associated with conventional practices.

Furthermore, confining animals may result in higher incidence of infectious diseases and parasites that will impact a farmer’s entire group of animals. It can be difficult to determine what diseases will impact animals that have not yet been domesticated once confined. In order to address these issues more research needs to be done on diseases, nutrition, and management (BOSTID, 1991).

Additionally, very little technical expertise on micro-livestock exists, which may limit support for farmers and, ultimately, the sustainability of these undertakings (BOSTID, 1991). The impact of this lack of knowledge is exacerbated by the strong ties between food and culture, tending to make individuals unwilling to invest in animals for food sources that they are unfamiliar with. Other cultural taboos and practices, such as hand feeding and penning small animals, may also limit the development of farming non-conventional animal species. Risk-averse attitudes about engaging in unfamiliar or new investments may make people uneasy about engaging in non-traditional practices.

**Crop-animal Interactions**

Integrating micro-livestock into agroforestry systems designed for or created by resource-poor farmers would create a ‘crop-animal’ farming system having unique functions and interactions not present in a tree-crop planting system

Historically, animal dung has played an important role in maintaining soil fertility in crop-animal farming systems (Asfaw and Agren, 2007) However, smaller farm sizes and growing poverty can lead to
the decline of livestock in farming systems (Asfaw and Agren, 2007). Farmers have identified the reduction of livestock in farming systems as a major contributor to decreased soil productivity (Asfaw and Agren, 2007). While the ability to sustain small livestock is complex, it has been documented that many farmers express interest in integrating animals into their cropping systems, particularly those farmers engaging in agroforestry projects (APERL, 2008)

In humid and sub-humid climates, soil productivity is an increasingly pressing issue (Devendra and Thomas, 2002). Livestock provide important nutrients necessary for the productivity of soil, and over time may even contribute to the restoration of previously less productive soil (Devendra and Thomas, 2002). This is particularly important in areas where access to artificial fertilizers is low, or for farmers who cannot afford expensive inputs. Nutrient acquisition through manure and by other animal by-products can be achieved by the rearing of micro-livestock (Devendra and Thomas, 2002). Additional nutrients within the farm system allow for increased crop productivity, crop stability and even higher yields or more competitive products (Codjoe and Billsburrow, 2011). These advantages can be obtained by utilizing the naturally occurring by-products of rearing micro-livestock while simultaneously providing a less expensive alternative to synthetic fertilizers (Codjoe and Billsburrow, 2011). The application of manure on degraded soil can contribute to reductions in run-off, allow for the better absorption of precipitation, prevent drying and cracking, and reduce the likelihood of severe salinization (Devendra and Thomas, 2002).

Grazing animals can contribute to weed control and reduce the need for artificial inputs on farms (Devendra and Thomas, 2002). This has the potential for significant positive impact on both human and ecosystem health. Grazing livestock can promote healthy reproduction and growth of tree and plant species and create microclimates in which varying species can thrive.

Animal-crop systems allow for the production of valuable protein products (Devendra, 2004), as well as products that can be used in making clothing, crafts, and by-products that can be used for on-
farm use and fuel (Lenne et al., 2003). Livestock products are likely to be consumed at the household level or to be distributed to local and regional markets due to the difficulties associated with the storage, processing and distribution of perishable products. This is a significant benefit to encouraging livestock production, as it can stimulate economic growth at the grassroots level and increase the overall wellbeing of a community. Furthermore, the use of livestock in farming systems can lead to the more efficient use of resources, whereas waste products associated with farm production may be used as feed for the animals (Lenne et al., 2003). This is a type of agricultural intensification and can lead to a more sustainable, less wasteful production environment.

Livestock can also act as important assets during uncertain financial situations or during unpredictable environmental change (Soussan et al., 2000). In fact, livestock are often seen as contributing to the adaptive capacity of a household or community during trying economic times (Alary, Corniaux, Gautier, 2011). Adaptive capacity can be understood as the ability to cope during unfamiliar changes and is closely linked to the concept of resilience (Folke et al. 2002). Contributing to the ability of an individual or community to withstand change is the amount of social capital available to be utilized (Alary, Corniaux, Gautier, 2011). Livestock often contribute to the social capital of the rural poor by improving networks, wealth accumulation, access to markets and improving status within the community (Alary, Corniaux, Gautier, 2011). Livestock present the opportunity for rural people to engage in the ‘trading-up of assets’ (e.g. chickens to goats to cows to land) which means they have the opportunity to move towards more economically rewarding livelihood activities (Ellis and Mdoe, 2003). Ellis and Mdoe (2003) support the idea that those individuals who engage in a wide variety of livelihood activities are less susceptible to economic or environmental shocks within the community. Investing in livestock as well as food crop agriculture is one way rural people prepare for unexpected negative events (Ellis and Mdoe, 2003). The security these assets can provide is an important factor when
addressing poverty alleviation as poverty is sometimes defined as a feeling of insecurity or vulnerability (Farrington, 1999).

**Limitations of Crop-Animal Systems**

Livestock are often seen as detrimental to the long-term success and growth of tree and plant species, particularly to those trees that may have been otherwise used for timber and fuel wood, and sold at market (Teague et al., 2009). While these are real and immediate concerns to farmers and extension workers, this is largely a short-term implication of livestock in agroforestry systems. While a sustainable agroforestry project must balance both short and long-term priorities and opportunities, livestock in these systems can address both sets of needs and contribute to the long term social and ecological sustainability of the system.

Other concerns include overgrazing which can result in changes in plant species composition, accelerated soil erosion, adverse effects on water supplies. Water availability, and livestock demand for water resources is of particular concern in sub-Saharan Africa and must be addressed diligently, and managed carefully (Descheemaeker et al., 2010). Additionally, attempts to support large numbers of these animals can exacerbate degradation and present further problems for farmers during less productive times (Teague et al., 2009).

A large proportion of agriculture related research in West Africa is focused on improving the crop components of income generation and food systems (Dossa et al., 2008). This research and related agricultural policies largely overlook the potential of micro-livestock to contribute to the improvement of the livelihoods of resource-poor people (Dossa et al., 2008). There is a need for more research that makes policy recommendations on how governments can use livestock in poverty reduction strategies (Dossa et al., 2008).

**Gender and Decision-Making in Livestock Management**

Economic and development researchers have had a tendency to view the household as a single entity in which all members had equal say and vested interest in the other members of the unit (Njuki,
2011). Some studies that examine the economics of households in the Global South still use this model of unified consumption and investment within the family today (Njuki, 2011). However, this idea has been challenged and questioned in the current literature. Underlying assumptions about developing countries can contribute to these types of overarching beliefs and approaches to development research. Despite this it cannot be assumed that each household in these communities makes decisions as a single unit. It is widely agreed in the literature that the opposite is true – that most households have individuals with vested interest in their own needs.

Terms used to describe this type of intra-household phenomenon include ‘cooperative’ and ‘non-cooperative’ (Njuki et al., 2011). In a non-cooperative household, members do not benefit equally from income generation endeavours. This implies that the different members of the family have different priorities and preferences and that each member will receive a variable amount of “welfare” or, in some cases, none at all (Njuki et al., 2011).

The notion of family members receiving ‘welfare’ from other members within its structure is particularly relevant to the research being reported here as many of the primary and secondary benefits of livestock (such as income, improved nutrition, use of by-products etc.) may not be evenly distributed throughout the household (Njuki et al., 2011). The literature on intra-household decision-making suggests that the individuals who control the asset are most likely to benefit from it in a way that suits their own priorities (Njuki et al., 2011). Intra-household dynamics may also be impacted by to what extent information is shared or withheld within the family (Fletschner and Mesbah, 2011). Due to men’s usual higher standing social status and connections through productive labour in and outside of their communities, much information that may be relevant to women’s long-term planning and livelihood strategies may not be shared. This is likely to impact women’s knowledge of financial institutions and market prices (Fletschner and Mesbah, 2011) vital for the effective development of income generation activities.
The amount of bargaining power that a woman within a household may have has been found, through multivariate analysis, to be correlated with how much information she has about financial and market information in her community (Fletschner and Mesbah, 2011). However, it should be noted that whether a woman is involved in non-farm productive work outside of the home is largely determined by intra-household politics as well (Fafchamps and Quisumbing, 2003). Social roles within the household impact how productive and reproductive work is divided amongst family members (Fafchamps and Quisumbing, 2003). In turn, these tasks may shape how and when women, depending on their ‘social role,’ are consulted and valued during decision-making processes (Fafchamps and Quisumbing, 2003). Social roles are determined by a variety of factors including bargaining, preferences, social norms, incentives, and problem solving. Fafchamps and Quisumbing (2003) found that households tend to operate as hierarchies with family roles determined by gender and status.

Gender dynamics within the household may impact decision-making processes and affect who benefits and how. Patriarchal households are prevalent in many communities in developing countries (Arshad et al., 2010), in which males often have the greatest amount of autonomy in decision-making. Acceptance of these belief patterns is often reinforced by social norms, traditional governing systems, religious teachings, and education or a lack of education (Arshad et al., 2010).

Typically, within patriarchal households in the Global South, men are better connected within their communities and often have better access to markets (Njuki et al., 2011). This is understood to be a result of women’s reproductive role. ‘Women’s work’ is often discussed as being primarily in and around the home. However, the outward migration of men for labour opportunities often improves the decision-making status of women (Smith Oboler, 1996).

Due to men’s involvement in productive work, they often better access to markets and they often receive better prices for livestock products (Njuki et al., 2011). As a result, women tend to lose control over those products that have high market value – stunting their ability to forge these market
connections over the long term (Valdivia, 2000; Njuki et al., 2011). This is particularly worrisome in respect to livestock rearing as women are more likely to use small livestock as a form of liquid assets which may be crucial to their long-term saving and management of short term socio-economic shocks (Paxton, 2009). Livestock should be understood as a non-traditional saving strategy that is more accessible to women than structured, formal financial services (Paxton, 2009).

In order to address these differences in negotiating power within the household, it has been suggested that focus needs to be put on women to enhance their internal strength (Khan and Bibi, 2011). The expected result is that by building women’s capacity they will be able to directly influence change within these household structures (Khan and Bibi, 2011). The literature shows that women’s and men’s expenditure patterns differ, with women spending more of their income on the household, in particular, on children (Paxton, 2009). Gender often acts as a determinant for resource allocation, and directly impacts decisions about saving and risk aversion (Paxton, 2009). One way to improve women’s decision-making power within the home is to increase women’s access to control over material and non-material resources (Boden and Zoe, 1997). Furthermore, improving the abilities of marginalized individuals, including women, to organize into groups can improve the social and economic assets of women (Khan and Bibi, 2011).

The idea that animal ownership, in rural farm-based communities in Africa, could be directly linked to the level of autonomy held by woman was first explored by Llewelyn-Davies in 1979. Later, based on her findings, social scientists including Bonnie Kettel explored the intricacies of the social systems that frame the role women have in livestock rearing, adding a more complicated explanation for the prevalence or lack of autonomy of women in rural households. Women can begin to establish autonomy by engaging of acts of support and exchange within their own networks (Kettel, 1989). In doing so, women are able to establish patterns of reciprocity with women and sometimes with men. This is of particular importance in resource-scarce times, when one woman may be able to rely on
another whom she has helped in the past (Kettel, 1989). Ultimately, this benefits the entire family structure, and ensures that practical needs can be met on a daily basis. However, without a woman having her own resource base and autonomy, establishing these relationships may not be possible due to intra-household power relationships and social expectations.

When managing livestock groups, the organization of individuals interested in sharing their knowledge and power may require certain resources. Those interested in benefiting from group formation must have knowledge about community needs; an ability or interest in investing in non-traditional livelihoods; openness to new technology; a desire for change; and a willingness to challenge culture barriers (Khan and Bibi, 2011).

Building group capacity amongst women can often be difficult due to their triple burden of productive, reproductive and community organizing work (Khan and Bibi, 2011). However, direct steps can be taken to integrate livestock into women’s daily lives while concurrently reducing the productive burden of income generation such as increasing access to fodder (i.e. planting fodder species near the home) and reducing prevalence of illness (i.e. encouraging vaccinations and daily upkeep of pens) (Khan and Bibi, 2011). For marginalized women, the rearing of micro-livestock offers many benefits including economic assets, less vulnerability to intra-household dynamics, social benefits, and improved community networks (Khan and Bibi, 2011).

Due to the lack of control women often have over intra-household income in the Global South, increasing their participation in livelihood development can provide opportunities to improve the overall welfare of the family (Kristjanson, 2011). Integrating livestock into the lives of the rural poor can encourage the accumulation of social, economic, human, natural and physical capital (Kristjanson, 2011). These assets are critical in developing agency for disadvantaged women or other marginalized members of a family or community (Kristjanson, 2011). Agency is understood as the “power to act, reproduce, challenge or change the rules that govern the control, use and transformation of resources
Livestock are multifunctional in the sense that they provide many crucial functions that can improve the lives of rural people by providing a sense of security, behaving as an asset, allowing for saving, enabling long-term planning, maintaining capital, and by providing raw animal products (LID, 1999; Ashley and Nanyeena, 2002; Kristjanson, 2011).

Recent literature supports the notion that development policies that examine the reduction of rural poverty are better equipped to encourage socio-economic change if they ensure poor women’s access to resources (LID, 1999; Kirstjanson, 2011). The bulk of research on this topic illustrates that women primarily invest and spend money on household nutrition (Valdivia, 2000; Kristjanson, 2011). In particular, Kristjanson (2011) advocates that women’s access to livestock’s benefits is pivotal to transformation that allows for more secure rural households. In a recent review of the literature, Tipilda and Kristjanson (2009) found that critical issues in development initiatives aimed at encouraging women to undertake livestock rearing include: women’s ownership and control of livestock and livestock profits, women’s access to capital and livestock markets, health and nutrition (both human and animal), urban livestock and health and food safety, livestock services delivery, women’s groups, and issues related to risk, vulnerability and climate change (Tipilda and Kristjanson, 2009). Information available on these topics primarily comes from unpublished, non-academic sources and field data on the subject are unreliable (LID, 1999; Tipilda and Kristjanson, 2009). Field research focused on what livestock efforts are working in terms of aiding women and rural families diversify their livelihoods is needed (Kristjanson, 2011).

**Conceptual Framework**

The conceptual framework for this study is adapted from the work of Caroline Moser, particularly her 1989 paper titled ‘Gender and Planning in the Third World.’ This framework looks specifically at the gendered division of labour and how negotiating between members of the household can contribute to varying gender roles. These gender roles are largely responsible for the ways in which
women and men conduct their daily lives in order to complete tasks and meet a variety of human needs. As a result of successfully completing these tasks, a number of benefits can be achieved.

The conceptual framework utilized for this study demonstrates the who, how, why and when in relation to the relevance and use of micro-livestock in the daily lives of the study participants. By understanding the gendered division of labour, the researcher may better understand the opportunities for leverage by the participants to achieve practical and strategic gendered needs through the negotiation of gender roles.

![Figure 2.2: Conceptualizing Moser’s Framework in the APERL Project](image)

The gendered division of labour breaks down the typical tasks of women in the Global South and speaks to the way in which their days are organized to meet the varying needs of the household. This division of labour is largely a result of bargaining between genders. Productive work is understood as the work that generates resources such as money, food, and other types of capital. Reproductive work is predominantly understood as work that occurs within the household such as cleaning, cooking,
nurturing, providing health care, child bearing and managing other aspects of family life. Community organizing responsibilities is that work that strengthens networks within the community and makes it easier to complete necessary tasks. Community organizing work may include the exchange of goods and services such as the sharing of micro-livestock for breeding, or the sharing of resources to access and create markets. This type of work may also include the involvement in co-operatives, women’s groups, farmers groups, attending community meetings etc.

As mentioned above, these three types of work are conducted to meet both practical and strategic needs. Gender needs can be generally understood as: “Shared and prioritized needs identified by women that arise from their common experiences as a gender” (Deeves and Rayden, 2000, p.2). The concept of gender needs largely stems from Moser’s work on gender and planning in the Third World. Her writing separates these needs into two dominant categories: practical and strategic.

Practical needs can be understood as those needs that meet daily living requirements such as food, water, shelter, income generation, whereas strategic needs are those needs that improve the quality of life of an individual. Strategic needs may include: increased decision-making power within the household and/or the community; increased autonomy; entry into gender dominated labour opportunities; access or control over household or individual money; sharing of household responsibilities; land ownership; improved education and training opportunities.

The reward of meeting these practical and strategic needs may vary. A certain practice or role may be taken on for economic gain, or due to its efficient nature. Additionally, actions may be taken to improve an individual’s sense of self or better their representation within the household or community. Empowerment, equity and equality are primarily relevant to the achievement of meeting strategic needs and goals as identified by an individual. However, economic and efficiency factors may be more broadly applicable to achieving both practical and strategic needs.
Summary

The above literature highlights both the social and ecological components of the phenomena to be studied. It includes the necessary and applicable theories for understanding the assumptions inherent in the research. In order to address the complexity of the issues surrounding livelihood development, land conservation, and access to resources, a broad range of relevant themes are explored in order to explain the interconnectedness of the above disciplines and how they relate to both the APERL project, and the research presented throughout this document. The conceptual framework illustrates how micro-livestock management within agroforestry systems is related to meeting gendered needs, and how in this context it is a cyclical process. The next chapter will discuss the methods used in gathering relevant data that will be situated in the literature described above.
CHAPTER THREE

METHODOLOGY

Introduction
This chapter discusses the research theories used to design the study and how these theories shaped the approaches taken during field work. In addition, it describes the specific methods used in detail, including explanations of the specific measures taken by the researcher to implement these methods. In order to satisfy the research objectives discussed above, triangulation of methods is used to gain a comprehensive understanding of participant’s experiences with the explored phenomenon. The methods used for the study include: participant observation, analysis of secondary sources, semi-structured interviews, key informant interviews, and data collected on market prices of animals.

Fieldwork and data collection in Ghana started in May, 2011 and ended in August, 2011. Fieldwork took place within the four Agroforestry Practices for Enhanced Rural-Livelihoods (APERL) project communities within the Municipality of Sunyani – Fiapre, Dumesua, Ayakomaso and Kobedi. Each community faces its own challenges, and has varying needs in regard to what the APERL project can offer it. Additionally, the APERL project has supplied each community with slightly different resources, and the communities are generally accessed by APERL staff at different times.

Study Context
The study took place within the context of the APERL development project. Communities that were selected by APERL for the distribution of micro-livestock were included in the study. These communities were Fiapre, Dumesua, and Ayakomaso within the Sunyani Municipality of the Brong-Ahafo Region, Ghana. These communities are connected via a major roadway. Figure 3.1 shows the region, Sunyani municipality and the project communities.
Study Design

A case study approach has been taken to extract predominant themes amongst the three communities actively participating in the micro-livestock livelihood diversification activities. The data collected, described below, allow for a detailed description of each community to be formed, as well as a thorough understanding of themes within each community. A thematic, framework analysis of phenomena across the three communities was completed (Creswell, 1998). By taking this approach, “lessons learned” can be derived and, in some cases, applied to similar settings or projects (Creswell, 1998).

The methods chosen for this study aim to encourage community participation, allow for detailed understanding, and facilitate a descriptive analysis of phenomena. They intend to produce results that are applicable to the future of the APERL project and similar development strategies in the Region.

Epistemology

Social constructivism is a qualitative epistemology that frames human understanding of social and physical realities as being constructed by social, political and psychological interactions (Patton,
Subjectivity is valued as a means to deeply understand human perceptions of the world, and the phenomenon under study (Patton, 2002). The emphasis on human interactions and cultural systems requires the recognition of the complexity of socio-ecological interactions and limits generalizability (Patton, 2002). Instead, it allows for an iterative process and reflexivity on the part of the researcher (Patton, 2002). This allows the researcher to reflect on how her own implicit bias and assumptions may impact participant responses, results, and analysis (Patton, 2002).

The study embraces a feminist, postmodern framework as an approach to the research. Postmodernism emphasizes that the researcher is always present in the data collection process and that the voice of the researcher is always evident in the results (Palys, 1997). This approach attests that the process of research is equally as important as its outcome (Liambuttong, 2007) and requires that the researcher engage in a process of reflection while being responsive to changes in the study environment (White, Drew and Hay, 2009). Feminist methodologies value collaborative and non-exploitative relationships as a goal of the research, and stress the importance of avoiding the objectification of research participants by the researcher (Creswell, 1998). Furthermore, these methodologies attempt to improve the visibility of the female experience with the end goal to be strengthening to women’s social position (Lather, 1991).

Participatory research methodology principles were drawn upon in the design and implementation of the research methods. The research aims to be beneficial to research participants by including community members in the process of data acquisition. Multiple interviews with research participants allowed the researcher to interpret the preliminary understanding of responses, and to present and discuss the interpretation with those originally interviewed. In doing so, the research participants were given opportunities for input into data interpretation.

This type of approach is particularly relevant to the researcher as the study aims to find leverage within the communities to help women recognize and satisfy practical and strategic gender needs. The
research process allows participants to define what these practical and strategic needs are, and to identify the capabilities they currently possess or would like to develop in order to meet their needs. The study aims to satisfy the characteristics of the participatory research process as defined by Kassam and Mustafa (1982):

1. A subjective commitment on the part of the researcher to the people under study;
2. close involvement of the researcher with the researched community;
3. a problem-centered approach that utilizes data gathering from which action may be taken;
4. an educational process for both the researchers and people for whom the research is conducted; and
5. respect for the capability and potential of people who produce knowledge and analyze it. (p.70-71)

In addition to taking a participatory approach to the research methodology, the research approach is designed to frame the communities as a case study. Case study research is defined by its boundedness and specificity (Stake, 2005), meaning that the contexts in which phenomena are explored is extremely relevant to the findings. Each case is understood to be unique in its content and character (Yin, 2009).

Case study research is the close examination of people, groups, problems or programs to answer specific, previously formed, questions by completing in-depth descriptions and interpretations within a relatively short time span (Yin, 2009). It is often understood to be post-positivist in nature, excluding the impact of the researcher, and striving to achieve validity and objectivity (Stake, 2005). However, other scholars emphasize that case study research needs to be sensitive, respectful, authentic, holistic, descriptive, and inductive (Willis, 2007). The latter understanding of case study research is consistent with a feminist, postmodern, participatory epistemology that is desirable for the understanding of phenomena in the context of the APERL project. In this manner, the case study approach taken can be understood as being ‘inductive,’ in which the approach is to understand categories and themes from the perspective of the participants’ point of view (Palys, 1997). This means that experience in the field preceded the creation of theoretical understanding by the researcher (Palys, 1997).
The case includes the three project communities and recognizes each community at its unique point within the development project. The case used can be understood as ‘instrumental.’ This type of case study approach may use data on an individual, but is interested in using this information to provide insight into a larger issue (Stake, 2005). In doing so, instrumental case studies may allow for some generalization and applicability of the findings to be relevant to other individuals within the project communities or the communities at large (Stake, 2005). The instrumental approach to the case study may also enable findings to be suitable in being used in improving APERL project initiatives, or more generally, to similar development projects in the future (Stake, 2005).

In order to gather “rich, detailed data,” as necessary when taking a case study approach, (Willis, 2007) triangulation of qualitative methods is used to explore each of the research objectives. Triangulation allows improved accuracy of interpretations. Additionally, it helps to develop a more complete understanding of what the data are symbolizing about the socio-cultural and ecological environments in which the phenomena are taking place (Denscombe, 2007). The data collected from the study aim to be trustworthy and authentic. Sources used in analysis included: interviews; ranking exercises; key-informant interviews; project documents; direct observation; informal conversations and meetings with APERL Staff, National Service Personnel, Faculty at University of Guelph (UoG) and Kwame Nkrumah University of Science and Technology (KNUST).

**Data Acquisition Methods**

A variety of qualitative methods, in order to allow depth and richness of data, are used to understand the potential for micro-livestock to contribute to women’s gender needs. These methods included secondary sources, participant observation, semi-structured interviews, ranking exercises, key informant interviews, spatial analysis, and data collected on the market prices of animals.
Secondary Sources

Secondary data are used as a means to provide context for the research goal and objectives, as well as for demographic information. All secondary sources are examined for their authenticity, credibility and representativeness (Denscombe, 2007). This means that they are read while questioning whether the documents were genuine, what the purpose of the document was, who produced it, how long ago it had been produced, whether the events described were reported first hand, whether it had been edited, whether it was complete, and whether the text was clear and unambiguous (Denscombe, 2007). Documents are examined in this way to ensure that only reliable sources were used.

These data assist in determining an appropriate sample size for interviews and help to identify the beneficiaries invited to participate in the study. These sources provide preliminary information about types of agricultural production, distribution of micro-livestock and opportunities for training and education within the communities. The goal of this method is to help support the rationale of the research, and provide evidence for its necessity by analyzing information gathered prior to, and over the course of the APERL Project.

Analyses of documents generated through activities completed within the context of the APERL project are also used (see Appendix One). Records from appropriate APERL meetings are used as part of the secondary source analysis as they provide a clear, concise record of events throughout the Project’s development (Denscombe, 2007). Furthermore, they are publicly available to project participants, employees and other stakeholders. Livelihood action plans, and minutes from training workshops on livelihood diversification are particularly useful in understanding the interactions with micro-livestock by community members. These documents shed light onto the current needs and priorities of women and their communities, as well as on their future plans and aspirations.

Content analysis of secondary sources is completed by breaking the text into small units and coding for categories, frequency of categories, and relationships amongst the pieces of text. Coding, as described below, is a first means of deconstructing and understanding the data gathered. Furthermore,
comparisons are made between beneficiaries’ interview answers and responses previously documented through other means. In this way, information provided can be compared, contrasted and checked for consistency. This type of content analysis allows for the understanding of priorities, values and relationships inherent in the development of livelihoods and micro-livestock production (Denscombe, 2007).

**Participant Observation**

Participant observation is broadly understood as a process used to begin to “know” someone, or a community of people, that is fundamentally different from the researcher (Palys, 1997). This technique is used by the researcher in order to learn more about the wider socio-cultural environment in which the research took place. Observations document visible interactions of beneficiaries and micro-livestock; as well as unique social interactions, or disparities in commonly observed behaviour.

Participant observation takes many forms; however, there is consistently an emphasis on obtaining a ‘holistic’ understanding of events and interactions (Denscombe, 2007). Due to the researcher’s obvious appearance as an outsider, combined with her cultural and socio-economic bias, it was deemed appropriate to chose to use the method of ‘participation as an observer’ as opposed to other techniques such as ‘total participation’ (Descombe, 2007). The difference here is that those being observed were aware of the researcher during observation, as well as the intentions of the research. Only by visiting the communities regularly and attempting to build trust and familiarity could any inherent differences from the communities be put aside to allow for insights into the phenomena being observed.

Field notes acquired through participant observation were recorded throughout the duration of the research (May, 2011-August, 2011). To understand the community entry process of the researcher, refer to Appendix Two. Journals contain important contextual information for understanding and interpreting data generated through other methods. In addition, the knowledge gathered through this
method provides insight into social, political and ecological phenomenon that was more difficult to formally acquire.

Informal conversations with students at the Faculty of Forest Resource Technology (FFRT) campus, discussions with National Service Personnel), time spent with project leaders, managers and faculty involved with the APERL project are useful for developing a holistic understanding of women’s innovations in utilizing micro-livestock to meet gender needs. These informal discussions are documented within the researcher’s journal and are being interpreted throughout the research process to gain a richer understanding of socio-ecological interactions.

Observations are initially recorded to allow for a general understanding of the research context, the participants, and the researcher’s role and impact on the study. As the research progresses, the researcher analyzes the data collected by this method by identifying ‘special observations’ i.e. seemingly important, interesting, or contradictory behaviours and events (Denscombe, 2007). These observations are then explored to identify problems, barriers, or cultural occurrences that may be impacting beneficiaries’ progress with the APERL project, their participation in the research, or their success with micro-livestock as a livelihood.

**Research Assistant**

To increase the likelihood of success in obtaining authentic observations, the researcher hired a research assistant who was familiar with the communities involved in the study. The research assistant has helped with the APERL project in the past, and has also aided past foreign researchers with the collection and analysis of qualitative data. This research assistant was recommended to me by a previous UoG Graduate research student, who had been assisted by him in her own research. He was also recommended to me by professors at FFRT. An interview was held between the researcher and the potential research assistant prior to his selection and the goal and objective of the research were explained. Additionally, conversations about the importance of authentically representing participants
were held. Further conversations about the selection and timing of interview participants were conducted prior to forming a final agreement.

The research assistant had completed a degree in tourism and resource management at FFRT. Afterward, as a NSP, he participated in the implementation of APERL project activities. The research assistant had also been involved with qualitative data collection and analysis for a previous UoG student in the Project communities. At the time of the study, the research assistant was participating with a qualitative study on the impact of tourism on rural communities in Ghana with Vancouver Island University and was also conducting qualitative research with the not-for-profit Freedom Stones, focusing on advocacy for victims of human trafficking.

As a result of his work in the project communities, because of his familiarity with the research setting, and his positive reputation in the communities allowed him to have access to appropriate contacts and settings in the field, he can be understood as the ‘gatekeeper’ who helped the researcher in ensuring that the appropriate people and situations were being observed (Denscombe, 2007). Other gatekeepers during the collection of data include: community chiefs, assemblymen, APERL Project community leaders, Faculty at FFRT and NSP.

**Semi-Structured Interviews**

In-person, semi-structured interviews were conducted during the primary research phase. Interviewing as a qualitative technique aims to “generate data that gives authentic insight into people’s experiences” (Silverman, 1993 p. 91). These interviews aim to provide insight into the beneficiary’s perspectives on rearing micro-livestock and the socio-cultural environment in which the actions took place. Qualitative interviews based on the use of open-ended questions often function to provide insight into both socially constructed and subjective experience (Crouch and McKenzie, 2006). By using a form of inquiry that allows for the informant to expand and elaborate on their opinions of the phenomenon to be analyzed, a wide range of responses can be gathered (Palys, 1997). Furthermore, it allows for the close analysis of nuances and thought patterns that may be open to interpretation such as the order in
which the respondent chooses to organize thoughts, repetition of ideas, and the returning to or avoidance of certain subjects by the participants etc. (Palys, 1997).

This interview method uses open-ended questions and is flexible in regard to the order of the topics being considered (Denscombe, 2007). The interviewee is allowed to explore concepts and develop ideas as the researcher proposed questions (Denscombe, 2007).

Conducting the interviews orally is more culturally appropriate than other forms of interviewing or the distribution of questionnaires. Oral tradition is strong in Ghana, and the cultural emphasis put on in person communication is apparent. Additionally, oral interviews are suitable for both literate and illiterate participants, a consideration that is necessary to allow for equitable input from all participants.

By visiting the communities regularly, the researcher hoped to build rapport with participants to ensure that interview respondents felt comfortable in sharing candid and detailed responses to the questions. The researcher also aimed to improve the acceptability of the interviews to the beneficiaries by hiring a research assistant who has been working with the communities, with the APERL project, for a number of years. His familiarity with the beneficiaries put both the researcher and the participants at ease and allowed for the easy flow of communication.

At the time of data collection, July 2011, records from the APERL study indicated that, across the communities, 38 farmers received goats and sheep, 13 beneficiaries were given pigs and four individuals received grasscutters. The list of beneficiaries was used to identify those that had received micro-livestock from the APERL Project.

Stratified purposeful sampling was used to select participants for semi-structured interviews. Purposeful sampling was used to select those individuals who meet criteria that is consistent with the goal or purpose of the research (Miles and Huberman, 2004; Patton, 2002). This type of sampling is used in qualitative research to gain a richness of data which requires specific intention opposed to
randomness (Ezzy, 2002; Patton, 2002). Strata are represented by the three communities used in the case.

In the three communities, the participants were chosen based on the following criteria: the community in which they live, their participation in the APERL project, their gender, and the ownership of micro-livestock. Five farmers were purposefully selected from each of the three communities, totalling fifteen interviews.

The semi-structured interviews consisted of approximately seventeen questions and were one half-hour to one hour in length. Interviews of similar structure were used for all beneficiaries. Interviews for the study were taped by an audio recorder; the researcher and the research assistant are both present during the interviews. The responses from the participant were translated by the research assistant during the interview while the interview was simultaneously tape recorded. The research assistant transcribed the responses from the recorded Twi (the predominant local language) at a later date. The researcher was then able to observe any differences in the transcribed and oral accounts of the interview and ask for clarification where necessary. The researcher also took occasional notes during the interview process while being careful not to interrupt the flow of the interview. These notes highlighted observations and responses important to the researcher, and acted to demonstrate to the participant that the researcher was engaged and interested in the responses being given. Written notes can also act as backup in case of technological difficulty.

A second, semi-structured, interview was conducted with each of the participants, excluding those in the comparison group. These interviews functioned to allow follow-up by the researcher on any questions that needed additional information. Additionally, by presenting the researcher’s preliminary understanding of the data to the participants, beneficiaries were able to clarify and correct any misinterpretations or inaccurate initial coding. Another benefit of conducting a second interview is the opportunity to build trust and rapport with the participants. Sequential interviews are an important
component of a feminist approach research as they allow self-disclosure on the behalf of the researcher, encourage feelings of collaboration and equality, and promote open dialogue and negotiation of the interpretation of responses (Creswell, 1998). The questions used for the follow up interview are largely dependent on the participant’s answers during the first interview aiming to provide more insight and elaboration on those topics not clearly answered or fully explored.

During the second interview, a ranking exercise takes place. The ranking exercise serves as a way for the researcher to validate interpretations and understanding of the data collected initially. Benefits, constraints, and ‘micro-livestock income’ expenditure are identified by the researcher from the preliminary interview, secondary sources, participant observation and key informant interviews. These categories are represented pictorially on cards. Culturally appropriate symbols were created and drawn by the Ghanaian research assistant. The cards are explained to the beneficiary orally and then given to the interview participant to rank. Three ranking exercises took place for each of the above mentioned categories: benefits; constraints; and ‘micro-livestock income’ expenditure. During the activity, participants were also given the opportunity to create their own cards, or to have the research assistant draw another card if their experiences are not adequately captured by the premade cards. These self made cards are categorized as ‘other’ in the analysis of the responses. The researcher then uses a simple scoring method to understand the commonality and trends among the answers.

To analyze the semi-structured interviews, the researcher extracts themes and categories from the transcribed versions of the participant’s responses. These themes, in combination with stories from the beneficiaries, illustrate insight into the study’s objectives. Providing a detailed description of the beneficiaries’ experiences with an emphasis on the study’s setting is paramount in illustrating the findings of the research (Creswell, 1998). The answers from these interviews facilitate the method of understanding. The findings of this process, in combination with other methods, allow for the interpretation of the significance and reliability of each sentiment extracted from the data.
Key Informant Interviews

Key informant interviews were conducted with five individuals to better understand the role of government agencies, development organizations, and researchers involved with micro-livestock rearing in the Region. The information collected from this method was used to provide more depth and context to the analysis of the results of semi-structured interviews and participant observation. The analysis of the interview data leads to important insights and improves the researcher’s understanding of the beneficiaries’ current practices and knowledge base. Analysis of the data provides insight on important networks and programs available to beneficiaries to support new livelihood activities and innovation.

These key informant interviews were conducted in English by the researcher with assistance from the research assistant. The interviews were recorded with an audio recorder and then transcribed by the researcher at a later date. The length of the interviews ranged from one-half hour to one and a half hours. The difference in length is attributed to the individual’s expertise and available time. Interview questions vary between specialists depending on their areas of proficiency and experience. These interviews served to delve deeper into some of the questions and issues that arose from initial observations and interviews with project beneficiaries. Additionally, the questions aimed to complement those questions asked of project beneficiaries. This was done to ensure a significant understanding of contextual interpretation, local nuances, and researcher bias.

The key informants were identified based on their relevance to the study’s preliminary findings and assumptions. The participants were selected with the intention of interacting with a range of individuals and organizations that have a high level of familiarity with micro-livestock rearing in the region. Key informants include: the regional director for Brong-Ahafo at the Ministry of Food and Agriculture, Ghana; a university lecturer directly involved with livestock research and the APERL project at the FFRT campus of KNUST; a community Trainee and Trainer of GIZ’s grasscutter rearing program; a
MOFA trainer of project beneficiaries on livestock rearing and animal husbandry; and the Assemblyman of Dumasua familiar with livestock rearing practices and animal taboos in his community.

**Data Collected on Comparative Market Prices of Animals**

Data were collected on market prices of animals and was completed by collecting information from other non-project-involved community members on the price of the micro-livestock (sheep, goats, pigs, grasscutters) at different points in their development. These community members are often employed as micro-livestock raisers, as a chop-bar operators, or as a “middle-person” who buys and trades animals from those who raise them and those who sell them as meat products.

The prices of the animal’s young (at birth), a breeding female, and an adult male are collected for each type of animal within a period of three days. Set weights for each animal are provided to those surveyed in order to ensure that the cost recorded was standardized to the average weight of each type of micro-livestock at the specific point of development. Information about average animal weights are gathered from secondary sources, training manuals developed by MOFA and/or the German international development agency (GTZ), and interviews with Faculty at FFRT who have had experience completing research with micro-livestock.

This information is used in collaboration with key informant interviews to provide context to statements from interview participants and beneficiaries. Market analysis data helps to provide insight into the accuracy of beneficiaries’ responses, and eliminates the impact of respondent bias’ on the data collected.

**Data Analysis**

During data collection in the field, all data were recorded as accurately as possible either by hand or by audio recorder. Additionally, an effort was made to have the opportunity to check and validate initial analysis with the research participants. Both during and after the field work, collected data were transcribed into word documents, and coded for themes and categories of phenomena. Furthermore, the overlapping use of the variety of data collected from various methods leads to a
holistic understanding of phenomenon, and prompts the further exploration of ideas particularly relevant to the research objective. The raw data were analyzed to take into consideration the practical and strategic needs projected to be relevant to the population study as based on Moser’s (1989) work; the impact of training, community networks, past experiences and the retention of knowledge as it pertains to these needs; and the power relationships, social hierarchy and understanding of the individual’s gender, as prescribed by Stewart (1994), that may contribute to priorities and capabilities.

**Limitations of the Methodology**

The design of the study presents some limitations in ensuring valid and authentic data. However, limitations commonly accompany research decisions. As a result, a number of limitations for the study should be documented. These include the impact of the researcher as an outsider; the researcher’s association with the APERL project; the use of a translator during semi-structured interviews; the length of time spent in the field; and the time at which the study was conducted in relation to the project life-cycle.

As a Caucasian, English speaking, Canadian the researcher was visibly an outsider in the project communities. As a result, it is anticipated that this may have led some of the study participants to be wary of the intentions of the researcher, and in other cases may have led participants to be shy or reserved through the interview process. Additionally, it is likely that perceptions about the outsider shaped some responses of the participants in order to meet the perceived expectations and goals of the researcher. This could be particularly true in which the researcher was seen to be associated with the APERL project. Responses to interview questions may have been favourable to APERL, if it was perceived that any benefits from the APERL project were related to the role of the researcher. Steps to mitigate the above impacts were taken by the prolonged time spent in the field; by becoming familiar with communities and potential participants for up to a month prior to any interviewing taking place; and by ensuring that the participants knew that their participation and answers in the interview in no
way influenced their relationship with APERL either negatively or positively. Furthermore, a research assistant who was well known and respected in the community was used for conducting interviews and assuring the participants that their answers were not going to be shared amongst the community in any direct way.

While the use of a research assistant and translator provided many necessary benefits, including acting as a gatekeeper, building rapport and providing translations – translations can act to distort the richness and context of a statement. This was managed by selecting a research assistant who has had experience working in qualitative research previously with a Canadian researcher. Training with the researcher took place in order to ensure that the research assistant understood the goal and objectives of the researcher and all associated ethical issues. The importance of direct translation was reiterated to the research assistant throughout the field portion of the data collection. Last, the researcher ensured that she was able to carry on respectful introductions and casual conversation in the predominant local language, Twi, in order to establish mutual respect at the beginning of the interview.

Diminished quality of some of the audio recordings was a problem during the interview process. It is not always possible to access the participants in a quiet area due to the level of noise that is common place within the home or in some of the areas where participants were accessed while carrying on another livelihood activity. Accessing participants in the home or at a livelihood activity (e.g. roadside provision stand, farm etc.) is common due to women’s triple burden and the busyness of the participants’ day-to-day lives. In order to address this issue, the recordings are transcribed both by the research assistant from Twi and then by the researcher from English to allow for the addition of any extra details that may have been more audible in one language than the other.

While the data collected are varied in nature, and a significant time was spent building rapport with project beneficiaries and study participants it is always advised that as much time as possible is spent in the field. For an outsider to the community, this is the only way that a researcher can begin to
understand and appreciate the complex interactions among social, cultural, and environmental realms. The researcher dedicated four months to working in the field for the purpose of building relationships and collecting meaningful data. However, it was found that many organizations and individuals in the community had valuable information on the role of micro-livestock in the communities. More data could always be collected and the insight from those not consulted will, of course, be truly missed.

Establishing relationships with each of the participants during the four-month period was challenging due to time constraints and the researcher’s participation in other activities necessary for the function of the APERL Project. While working with the APERL Project, the researcher was also assisting with daily office tasks, data entry on APERL activities, and on-the-farm work such as pegging and planting for fruit trees. While this improved the researcher’s overall understanding of the role of APERL in the communities and helped to establish rapport with the beneficiaries, it also took away from time spent one-on-one with research participants. Furthermore, access to vehicles and the hiring of taxis to visit the communities further from Sunyani was also problematic. Time and budgetary constraints played a role on the researcher’s ability to access the communities as frequently as she would have liked. Nevertheless, the researcher was able to speak to each participant on multiple occasions and in some instances act as a facilitator between community members and APERL staff, improving the overall relationship between beneficiaries and the Project.

The study aimed to evaluate the impact of an intervention that has been implemented in an ongoing basis over the previous two years. For this reason, and due to the gestation periods of micro-livestock, the researcher was unable to fully understand the long-term impacts of the animals on women’s livelihood development. However, the research did take place after all of the livestock had been distributed to all potential recipients of the intervention. And questions posed during interviews were open and inclusive of the ‘expected’ benefits of the micro-livestock on already existing and
anticipated needs. It would be useful, however, to understand how these needs change over the life-cycle of a micro-livestock livelihood.

Last, the researcher aimed to satisfy all of the criteria outlined by Kassam and Mustafa (1982) in order to allow for a participatory research process. However, due to constraints in the field including limited time and monetary resources, not all of the criteria were fulfilled. In particular, the researcher acknowledges that the criteria “…respect for the capability and potential of people who produce knowledge and analyze it” was not met. Research methods that employ the creation of knowledge on the behalf of participants should be promoted and encouraged in order to mitigate this limitation.

Despite the limitations inherent in all research processes, the researcher made a diligent effort to reduce those limitations that had the potential to be the most problematic. Careful planning prior to entering the field, and the informed selection of a research assistant helped to make an unfamiliar setting less of a barrier to obtaining valid and authentic data. The variety of methods used – participant observation, secondary document analysis, semi-structured interviews with beneficiaries, key informant interviews, and a market analysis – all helped to ensure that the data can be seen a trustworthy account of the participants’ experiences. The study used a instrumental case study design based on a social constructivist, post-modern and feminist epistemology which helped to facilitate a participatory and inclusive approach to the research, deemed appropriate for the communities involved and the subject matter at hand.
CHAPTER FOUR

FINDINGS

Introduction
The purpose of this chapter is to present the research findings as they pertain to the study objectives. The findings are drawn from semi-structured interviews, weighted ranking exercises, key informant interviews, a modified market analysis, APERL documents and conversations with staff, and participant observation. Sixteen participants were selected for the initial in-depth semi-structured interview, with 15 of these participants agreeing to take part in a follow-up interview involving the use of weighted ranking exercises. Four women and one male were selected from each community (Fiapre, Dumasua, and Ayakomaso); with one additional male participating from Fiapre to adequately represent the breadth of experiences with different animal species. Participants were selected based on their sex, animal species being reared, length of time they had had the animals, and willingness to participate in the study. The researcher and research assistant also attempted to select participants of varying ages, religious backgrounds, and family structures to represent diversity in priorities and expectations around animal rearing. A summary of the experiences of participants is included in the chapter, including narratives of the participants to help provide context and voice to the findings.

The first section presents information on the participants who took part in the semi-structured interviews, including decision-making strategies for animal rearing activities. This section includes demographic information such as age, education level, and sources of income; decision-making patterns in the household including the prioritization of resources for micro-livestock livelihood development; and a modified market analysis of the sale value of micro-livestock species.

The second section presents the results of the framework analysis applied to the semi-structured interviews in which the 16 beneficiaries participated. This framework directly links the
research questions with the results to better understand how micro-livestock, in the context of APERL, is contributing to women’s practical and strategic needs. In order to do this, codes from the framework analysis are used to divide and organize information, while the relevant data collected are presented in relation to these codes. For example, results from the key informant interviews are used to provide further contextual information about the beneficiaries’ experiences, and to provide an institutional perspective on micro-livestock rearing in the Brong-Ahafo District.

**Semi-Structured Interview Participant Profiles**

Twelve women and four men were selected to participate in an in-depth semi-structured interview, with four women and one man each from Fiapre, Dumasua, and Ayakomaso. In Fiapre, two men were interviewed to ensure that men rearing each type of micro-livestock were captured in the study. Across the communities, both men and women were selected so that each type of micro-livestock was represented proportionately to the numbers of overall micro-livestock distributed in the communities i.e. more respondents with goats or sheep were included in the interview process than pigs and grasscutters. Participants of different ages were selected to ensure that the sample was not too homogeneous; however, most of the respondents were between 26-35 years of age (Figure 4.1 and Figure 4.2). Age ranges were variable within each of the communities with Ayakomaso having the highest amount of participants under the age of 31 years old. None of the participants were younger than 25, with the youngest participant being a 26 year old female. The oldest participant was female and resided in Fiapre. Figure 4.1 shows the distribution of age among the beneficiaries who were involved in this study as research participants.
The APERL baseline survey reports that 28% of respondents did not go to school, nine percent have had primary education and 44% have had Junior Secondary School or Middle School Leaving Education (JSS/MSLE), as their highest level of schooling completed. Approximately eight percent of baseline survey respondents have had secondary education, and those with tertiary education comprise five percent of respondents. The education level of interview participants is somewhat similar to these statistics, with 18% of semi-structured interview participants having no formal education, 25% of participants having completed primary education, 43% having completed JSS/MSLE and one individual or five percent having attended secondary school. Those with no education varied in age, with those reporting not having ever attended school being 26, 29, and 73 years old. Those with the highest levels of education were all male. However, one 60 year old male respondent reported only ever having attended primary school. Many of those surveyed indicated that they had attended the next level of education, but did not complete it (i.e. many attended the first year of JSS/MSLE).

Those individuals who attended the next level of education but did not complete it cited a number of reasons for their inability to continue their studies. Lack of financial resources was the main reason cited for not continuing with education. Commonly, respondents referred to their parents’ not valuing education as a main contributor to their not completing the level that they last attended. Other
reasons for failing to finish school included wanting to pursue an employment opportunity such as driving a taxi, baking bread, becoming a tailor, or learning the hairdressing trade. At the time of the interview, only one respondent was participating in one of these alternate employment opportunities as a way to supplement their income. Many of the respondents reported that there was not a demand for these types of trades or that it was not economically viable to access the resources necessary to provide the service.

**Table 4.1: Highest Level of Education Completed**

<table>
<thead>
<tr>
<th>Level of Education</th>
<th>Fiapre</th>
<th>Dumasua</th>
<th>Ayakomaso</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Education</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Primary</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>JSS/MSLC</td>
<td>4</td>
<td>0</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>SSS/GCE</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>16</td>
</tr>
</tbody>
</table>

The baseline survey indicated that half of the respondents engage in one income-generating activity, and half of the respondents diversify their agricultural livelihoods with other secondary sources of income. Over 63% of all respondents earn their primary income through arable agriculture, with woman engaging in petty trading as the dominant type of alternative income-generating activity. Semi-structured interview participants closely mirrored the baseline study results in terms of percentage engaging in only farming activities at 44%. However, those engaging in both agricultural activities and secondary livelihoods were, comparatively, considerably lower with only 19% reporting that they practice both farming and non-farm activities to generate income. This difference may be a result of baseline respondents reporting on behalf of their household, whereas those interviewed for this study were asked to only report on the activities they participate in as an individual.

As a result of the semi-structured interviews, it appears to be common for woman to participate in the secondary income generation activity on behalf of their family. Petty trading of clothing, utensils, phone credit, candy and laundry soap were all common income-generating activities of the woman.
interviewed. Selling cooked food was also reported a number of times (n=3). Men did not report participating in these activities, and commonly cited farming (n=3) and driving taxis as primary income-generating activities (n=2). Two women, at the time of the interview, reported not participating in any income generating activities; one was supported by her father and helped with his animal rearing activities that were self-established prior to the APERL micro-livestock intervention; and the other was supported by her husband and was looking for opportunities to engage in income-generating activities. In the past, she had helped her husband raise animals but was relatively new to the community and could no longer participate in his animal rearing activities because of the animals’ location in another community. Both viewed rearing APERL micro-livestock as a way to contribute to their family’s wellbeing.

Table 4.2: Distribution of Sources of Income Generation

<table>
<thead>
<tr>
<th>Livelihood Types*</th>
<th>Fiapre</th>
<th>Dumasua</th>
<th>Ayakomaso</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Exclusively Farming</td>
<td>2</td>
<td>12</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Farming and Non-Farm Activities</td>
<td>2</td>
<td>12</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Non-Farm Activities</td>
<td>1</td>
<td>6</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>No Income Generation</td>
<td>1</td>
<td>6</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>36</td>
<td>5</td>
<td>30</td>
</tr>
</tbody>
</table>

*Excluding small scale livestock rearing*

Information about household decision-making on who manages resources and finances and who controls the benefits of micro-livestock livelihood opportunities was collected during the semi-structured interviews. When making comparisons between responses of the individual managing finances within the household and the main beneficiaries, there is a strong connection between who manages finances and who benefits directly from livelihood activities. This is particularly true in the case of women who were the intended beneficiaries. This should be noted because although the project is set up for micro-livestock to go directly to one beneficiary, benefits are often shared amongst the household. Partners may be involved in constructing pens, and providing capital and resources for the livelihood establishment.
Shared benefits also seem to be a result of initial shared financial management in the household. There is a greater likelihood of a woman solely benefiting from the micro-livestock if she is already in charge of managing finances within the household. The semi-structured interviews reveal that in cases where the woman is in charge of the primary management of finances, she is either widowed or her husband works and resides in another community. In Fiapre, one case does not follow this trend where both partners were beneficiaries of the APERL project micro-livestock intervention, and they had agreed to manage their micro-livestock and related finances separately. In this household, it was explained to the researcher that prior to the intervention both husband and wife were earning and manage their finances separately.

Tables 4.3 and 4.4 illustrate trends in responses to questions about household financial management and the primary recipient of micro-livestock benefits. These tables give some information about how these two activities connect including the involvement of the family in these processes, and any gender differences in responding to these types of questions.

**Table 4.3: Household Financial Management**

<table>
<thead>
<tr>
<th>Individual Managing Finances Within the Household</th>
<th>Ayakomaso</th>
<th>Dumasa</th>
<th>Fiapre</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Beneficiary (female)</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Primary Beneficiary (male)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Husband</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Wife</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mother</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Father</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Shared</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5</strong></td>
<td><strong>5</strong></td>
<td><strong>6</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>
Table 4.4: Primary Recipient of Livestock Benefits

<table>
<thead>
<tr>
<th>Primary Recipient of Benefits</th>
<th>Ayakomaso</th>
<th>Dumasua</th>
<th>Fiapre</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Beneficiary (female)</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Primary Beneficiary (male)</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Husband</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Wife</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mother</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Father</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Shared</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>16</td>
</tr>
</tbody>
</table>

In the cases in which males were the recipient of micro-livestock, they tended to already manage finances within their household independently and also self-identified as the primary beneficiary. One man in Fiapre indicated that he and his wife are both responsible for household financial management and that the benefits of the micro-livestock would be shared between them. None of the male participants reported having their mothers’ or wives take care of financial management within the household. Similarly, none of the male participants reported their mothers’ or wives as the primary beneficiary of the micro-livestock livelihood. In no cases where woman were involved with the establishment and maintenance of the micro-livestock did they report their husbands as the primary recipient of the livelihood benefits. Having benefits shared amongst spouses or families had the highest response rate. K.I.3 touched on this cultural phenomenon in his interview:

“Where you have a very good husband and wife relationship, you see the women are taking good care of the animals. They know it is property for both the husband and wife.” (K.I.3 Interview)

During the ranking excercise, more information was provided about how the participants prioritize and conceptualize their micro-livestock livelihood, and the main ways in which the livelihood was being utilized. Primarily, income was prioritized as the most important function of the livelihood. This can be understood as contributing to women’s productive roles. By-products like meat and manure were ranked further down the list as the most important ‘benefits.’ These other benefits may be seen as
supporting women’s ‘reproductive’ roles. Interestingly, no beneficiaries mentioned milk as an animal by-product during the initial interviews, and therefore it was not included in the ranking activity. Additionally, only one respondent mentioned sheep skin as being an important animal by-product for the use of a prayer mat. When the researcher brought this up during the ranking exercise, the respondent chose not to include it in her ranking.

Other intangibles, such as sense of security and knowledge, either gained by attending Wenchi training or through experiences in raising the animals, received scores of 62 and 60, respectively. These can be understood to fall into the benefits code of the framework. Manure, a resource that may be used to help further develop farming or could be marketed as a product on its own, earned a score of 55 points, illustrating that these three benefits were all of importance amongst the participants. Meat products and social status both earned scores of 45 and 44, respectively. As a result, these can be explained to be of relatively equal importance to each other but not as important as income, sense of security, and the knowledge acquired by participating in animal rearing.

![Figure 4.2: Ranking of Micro-livestock Livelihood Benefits by Participants](image)

The second ranking exercise highlighted the constraints that beneficiaries were facing in the development of their micro-livestock livelihood. The researcher identified and presented seven different
constraints from the original interviews and added another category for ‘other’. The total possible score for a variable that was ranked as the largest constraint by all 15 participants would have been 105. Slightly more variability can be seen in the ranking of constraints compared to the benefits. Accessible and affordable veterinary services are visibly the largest constraint as ranked by the participants – it received a score of 94 points. This can be broken down into two separate issues – one relating to women’s community organizing roles (access) and one having to do with the availability of resources (affordability). Pen construction and maintenance, and disease and animals are also common and serious concerns for the participants.

A key informant (K.I.2) from FFRT expressed that pen construction is often the first barrier to developing micro-livestock livelihoods, and next to veterinary care, is the primary constraint for beneficiaries. The ranking exercise confirms this statement. Constraints that are less serious but considerably common include the affordability and knowledge of appropriate feed supplements which are believed to improve growth and fertility rates, and the availability of land and land ownership, either for the expansion of pens or the security of the land). ‘Other’ constraints identified by participants included capital for investment into the livelihood, and the increasing growth and urbanization of the area.

A large number of participants also said they had family members or friends who raised animals and they were able to consult them for advice. Lastly, water received the lowest score with only four points. None of the participants identified water availability as a major constraint.
The third ranking activity was done to understand how income, if the most important benefit of the micro-livestock rearing livelihood, was to be used. In this exercise seven areas of expenditure, as identified through the initial interview process, were represented on cards for the participants to rank. Participants were able to add in ‘other’ categories as they saw fit. The highest score for any one of the variables would have been 105. School fees were ranked considerably higher than the other areas of expenditure with a total score of 93 points. However, ‘health care,’ ‘land ownership,’ ‘food,’ ‘investment in business,’ and ‘farm labour,’ all ranked within nine points of each other. This shows that the priorities for participants were varied with different individuals engaging in micro-livestock rearing with the ambition of fulfilling different needs. Interestingly, clothing was not identified by any of the participants of being of particular practical or social significance. A number of beneficiaries expressed that they only needed a few changes of clothes and beyond that, purchasing clothes was not necessary. There was also considerable emphasis on the accessibility and affordability of second hand clothing. One ‘other’ was suggested by a male beneficiary, and the category was ‘travel.’ This participant expressed that travelling to see family or friends in other communities was costly, but a necessary part of his routine, and that this was one way he anticipated spending revenue from micro-livestock.

Figure 4.3: Ranking of Constraints on Micro-livestock Livelihoods by Participants
Overall, it is interesting to observe that in two of the three exercises there is one variable that is more highly significant, as determined by participants, than the other variables presented. This helps to give a clear picture of some of the major issues and expenditure areas. It is also helpful to see that in two of the exercises (benefits and expenditures) there is variability in the opinion of participants, illustrating that there is varied needs for the participants suggesting that there may not be a ‘one size fits all’ solution in developing support for micro-livestock livelihoods or understanding how it may contribute to the well being of an individual or household.

![Figure 4.4: Ranking of Areas of Expenditure for Revenue from Micro-Livestock Livelihoods](image)

**Gendered Roles and Needs**

The coding framework developed for this study (adapted from Moser, 1989) identifies gendered roles and needs. These roles highlight women’s triple burden: reproductive, productive, and community organizing. Within these roles, women have two main types of needs, practical and strategic. Data collected that represent these roles, and inherently the associated types of needs within the roles are presented below.
Gender Roles

Productive Roles

Data collected show that income-generation was at the forefront of women’s productive role. In some cases, this productive role appears to be prioritized above the traditionally perception of a reproductive role. Engaging in livelihoods that either provided the primary household income, or supplemented the income earned by other family members was of utmost concern. For example, it was observed that income came as the most important benefit of micro-livestock rearing during the weighted ranking exercises. This is true even when the data are disaggregated by gender. This means that income was ranked before other animal products that might be used in and around the home, such as meat or manure (for home gardens). These products may be seen to contribute to the reproductive role of women.

As a result of this high level of interest of participants in further developing their productive role, these women were highly concerned about the efficiency and sustainability of engaging in their new livelihood. Ensuring adequate water and food supplies are economic issues that relate to women’s ability to adequately fulfill their productive role via micro-livestock rearing. These issues relate directly to the amount of income that is able to be earned from the livelihood. Furthermore, the majority of the study participants felt as though the earnings from the micro-livestock livelihood could be invested in other income generation activities, as well. For those who already had established an income-generation activity (n=10), many of the respondents did not plan to stop engaging in it once the micro-livestock livelihood was fully established. Diversification of income-generation was a strategy that many of the women believed contributed to their security and financial decision-making power. However, these decision-making patterns are highly dependent on other aspects of the gender analysis framework such as gender roles and benefits.

Decision-making in animal husbandry and management can have a large impact on the amount of profit made from micro-livestock rearing activities. Study participants often explained the ways in
which the decisions they made helped to keep costs low, and therefore their animal rearing activities sustainable within their own, individual, means.

Study participants indicated that allowing animals to forage or providing them with household waste was the most cost effective way to feed micro-livestock. It was acknowledged by some participants that giving animals manufactured feeds was often beneficial to growth and reproduction of animals. However, even if they had at one point provided animals with feed, most participants stated that doing so over the long term was not cost effective. Most participants (n=10) viewed this as a constraint. Forage was generally said to be available all year round, including the dry season. However, unlike the beneficiaries who participated in the ranking exercise, a key informant (K.I.2) expressed that forage in the dry season can be an issue for farmers and that new types of forage opportunities are being explored through research at FFRT. Decisions about grazing appear to be linked to the expense of commercial feeds and the abundance of forage. Different approaches to feeding animals were taken from free-range to zero-grazing, and combinations of these two types of management practices. These management decisions are related to what type of resources are available, and the expense associated with different choices. However, they also are related to protecting animals from disease and theft, and therefore, the “bottom line.”

The Assemblyman in Dumasua (K.I.5) strongly supported the zero-grazing approach stating that it allows the owner to keep track of their stock, protects them from theft, injury, and disease. He also believes that if all community members practices zero-grazing, it would contribute to the overall health of the community by protecting people’s home gardens and by keeping animals out of the refuse dumps.

K.I.3. also discussed the benefits of zero grazing, but mentioned that he knew that zero grazing would be too labour-intensive for the lifestyles of many of the beneficiaries. He too encouraged the
more popular mixed grazing system. However, he believed that by reducing the amount of time an animal spends free ranging you may be able to limit their exposure to disease:

The zero grazing is good but the nature of the farmers is that they don’t have that time, it is labour intensive... We prefer the blend. So, the management aspect, you can see them in the morning to see they are healthy. Most of the communities you see, people are enclosing them because of by-laws or because people are complaining...It is because of urbanization” (K.1.3 Interview)

Theft was brought up as a concern by key informant (K.I.2) and (K.I.4). K.I.2 indicated that small animals that are kept close to home are easier to protect from theft, and that having a close knit community serves to discourage theft within the community. Larger scale animal production that is not developed close to one’s home is more likely to be targeted by thieves, and would require farm help that is not easily affordable to the majority of beneficiaries. K.I.4 explained that his grasscutter rearing business had been successful until one night his farm was raided and all of his animals were taken, even though he had housed them in his backyard. Despite this, a few beneficiaries (n=3) indicated that large scale animal production was their end goal, in terms of a long term income generation plan. This type of business structure was believed to offer the most opportunity for profit.

In terms of water availability and associated costs, beneficiaries largely stated that providing micro-livestock was not a constraint on their livelihood. This is reflected through the ‘constraint’ ranking activity. When asked, most beneficiaries indicated that they gave their animals water to drink but that accessing it was not a problem. The researcher probed respondents by asking if water availability was more of a problem during the dry season. However, none of the participants viewed water as a current constraint. Some respondents expressed concern that if the number of animals they were keeping continued to grow, water may become a problem in the future. Most of the respondents accessed water through wells in the community, and one indicated that a communal fee was paid if there was a problem with the well in order to have it maintained. However, in Ayakomaso, one study participant indicated that accessing adequate water has been a struggle:
“APERL made a borehole. But before the borehole was made that there was only one borehole in the community, and other communities were relying on the borehole as well. Before it was made, you could go to get water and wait two hours, and maybe by the time it was your turn, the water was finished. The problem of water was very bad. Even if you were trying to get water for the house it was a problem. They built a new borehole but the water is not good. The water is cloudy and when you let it sit for two days it is still cloudy” (Field Notes 3.1.M)

Despite this, study participants do not associate a cost with providing micro-livestock with water. A key informant (K.I.2) also stated that accessing water for micro-livestock sustenance and production is not an issue, and that water is available for this use even during the dry season.

Investment in already existing income-generating activities, and in planned business opportunities were a common theme in terms of how women plan to use the income generated from micro-livestock rearing over the short term. The ranking exercise is one source of data that exhibit this trend. ‘Investment in business’ was ranked 5th in terms of prioritizing expenditures. However, many examples were given by women on how they plan to invest the money from the new livelihood into other income generation activities:

“I would rather develop the livestock production and then some money I make from the goats would be invested in the business. Let’s say if I buy 30 or 40 clothes to sell, investing more will mean that I can buy a 100 or more to sell.” (Interview Du.1.1)

“Business is number one and I wouldn’t invest the money in the business I already have. I would want to save the money and use the profits from the animals that come from the animals. I want to use this money to create a provision store to keep vegetables but I would not keep tomatoes or peppers because they do not stay good for very long. I would rather buy corn because the value of corn increases overtime as corn becomes unavailable so I can generate a lot of income. So initially there is less income but overtime what you have stored will supply you with more income. So, poultry farmers during the dry season when there is no corn then they will buy it at higher prices so I will make more money.” (Ranking Du.3.1)

These ideas demonstrate long term strategic planning on behalf of female participants. However, indication of long term budgeting or planning seems to be comparatively low (n=4). The data shows that optimism exists around the potential of the micro-livestock livelihoods, however some
fundamental areas of knowledge and experience seem to need strengthening in order for these livelihoods to reach their full potential.

**Reproductive Roles**

Women’s reproductive roles involve providing resources for the family, specifically children, and those responsibilities associated with child rearing. Through the data collection process, the study provides information on how women conceptualize their reproductive role and how micro-livestock may contribute to it.

Through the ranking exercises, particularly those that addressed the ‘benefits’ of animal rearing, and the main sources for ‘expenditure’ data was gathered on the resources acquired through this livelihood. It is important not to only consider those resources identified, but also those animal functions that were viewed to be insignificant or appear to be underutilized as well.

The use of micro-livestock for household food consumption and the provision of manure for home gardens or subsistence farming are the two main examples of the use of animals for reproductive uses that were identified through the interview and ranking processes. These functions, although identified, come through as being less important than income, which primarily supports women’s productive roles, and other intangibles that support women’s functioning and growth across the roles that they fulfill.

Many women highlighted the use of animal products for household food consumption, but were particularly concerned with the size of their herds, emphasizing that meat products should only be acquired after their animal-based livelihood was established and sustainable. Here, income was prioritized before the direct consumption of the animal products. This was conceptualized to be more sustainable over the long term, and to support the long term development of their livelihood:

“I want their population to increase to about 15 before I start using them. If the population increases, I will use them for food but if their population does not grow as I expect it to, then I would not use them for food.” (Interview Du.1.2)
Nevertheless, when participants were asked about their motivations to choose one animal type above another, they often specified their preference for the animal based on their preference for the type of meat products that animal provides:

“I chose it because goat meat is the meat I like the most, I don’t even like the meat from sheep” (Interview Du.2.1)

“Yes, I like goat meat than any other livestock that’s why I chose goat.” (Interview Du.3.1)

This suggests the intention to use the livelihood as a means to provide an enjoyable and preferable food source. In one case, the beneficiary chose her animal species based on nutritional value and her children’s preference rather than her own:

“I don’t eat pork but my children eat it... It is nutritional... During festivities like Christmas I can kill some and share to my neighbours, visitors and friends.” (Interview Ay.2.2)

Manure use on home gardens and subsistence farming also demonstrates the use of micro-livestock to enhance women’s reproductive roles. Women reported that using manure often leads to healthier, more productive crops that can help to feed the family. In cases in which manure is collected and sold to other farmers, this resource would be seen as contributing to the productive role.

During the expenditure ranking exercise, the use of income to supplement women’s reproductive role became apparent. Providing for costs of health care, school fees, food products for household consumption, and clothing for the family are all ways that the income generated can contribute to women’s reproductive role. Although income is highly prioritized as identified through the ‘benefits’ ranking activity, the ‘expenditure’ ranking demonstrates that this income is primarily used for reproductive purposes. School fees and health care received the two highest scores, with food products receiving the fourth highest score. This suggests that meeting the family’s immediate needs are at the forefront of expenditure decisions.
Community Organizing Roles

Understanding where beneficiaries are acquiring information, how they are sharing their new knowledge and experiences as a result of engaging in the micro-livestock intervention, and what impact having micro-livestock is having on their ability to organize and access resources within and outside of their community is significant in understanding how micro-livestock contributes to women’s community organizing roles.

Two participants suggested that by creating and sustaining animal rearing groups, beneficiaries could save money by purchasing necessary treatments as a group and share the cost. It was explained that this way, because drugs have to be bought in large quantities, there would be no wasted medicine. By purchasing required treatments as a group, accessing drugs would require less of an initial investment and reduce the likelihood that the remaining treatment would be wasted. Neither of the respondents who suggested this strategy was already participating in animal rearing groups or associations.

Table 4.5: Attendance to Organized Animal Rearing Groups

<table>
<thead>
<tr>
<th>Community</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiapre</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Dumasua</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Ayakomaso</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 4.5 shows that none of the beneficiaries interviewed in Fiapre were attending any kind of group where knowledge of animal husbandry was being shared. Five of the six participants from Fiapre responded that veterinary officers were one of their main sources of knowledge and support in their animal rearing practices. Both male respondents indicated that they had friends who were veterinary officers whom they could consult and seek advice from.

There was consensus from all respondents that there were no extension services in Fiapre available that provided knowledge on animal rearing. Four of the six participants described other APERL
beneficiaries who had received micro-livestock as being another primary source of on-going support in their animal rearing practices. Participant Fi.2.2 indicated that she did not attend any organized groups for information on animal rearing but that she heavily relies on her father for on-going advice and support on how to raise the animals. She also indicated that she has a friend in Ayakomaso raising animals and sometimes discusses her practices with her.

From the responses and reactions of respondents in Fiapre, it appeared that no organized groups for sharing advice and resources for animal rearing were available within the community and that already existing connections and veterinary services were relied upon for support after the initial Wenchi Animal Husbandry training. However, the training also provided new connections amongst community members who were beginning to rear new animals; information sharing between those trained has lasted beyond the initial training sessions.

In Dumasua, the four respondents who indicated that they attend organized meetings about animal rearing all referred to meetings that were held in the community every two weeks on Fridays by an extension officer. These meetings are free, public and held outside of the Chief’s home. APERL beneficiary attendance is high, and one respondent estimated that approximately 20 APERL beneficiaries attend the meetings regularly. It was explained to the researcher that the MOFA staff involved in the construction of the demonstration pen in Dumasua are the same individuals who organize and hold the animal husbandry meetings. The community members have been told that MOFA may provide an intervention that also distributes animals to community members as a ‘next step’ to the demonstration pen project.

Two of the participants reported that there are also regular ‘APERL’ meetings, also held on Fridays at which beneficiaries get together and share information. As a result of this, these two participants responded that there were animal rearing meetings every Friday as opposed to every two weeks due to the two different groups of people meeting:
“Because of the man’s demonstration pen and APERL meetings we meet often as a community to discuss issues about our livestock. We meet every Friday to discuss issues. We want to help ourselves by contributing to buy drugs for the animals and have a veterinary man attend to the animals. This idea is a result of the series of meetings we had as a community which was facilitated by MOFA...” (Interview Du.2.2.M)

The Assemblyman in Dumasua who participated in a key informant interview also discussed the demonstration pen in detail, citing the meetings as an important educational opportunity for people in the community:

“He taught us how to construct the pen and also the importance of separating sheep from goats and also creating fodder banks and storage for the animals...The community demonstrated lots of enthusiasm during his work and it’s evident that the group that meets was established because of this project.” (Interview, K.I.5)

Through this key informant interview, the Assemblyman explains how an individual in a leadership position is able to influence the level of interest of community members in meeting in groups. This demonstration pen was also built concurrently with APERL micro-livestock rearing training and, while not entirely intentional, served to reinforce the efforts of APERL by providing information and support outside of APERL’s planned intervention.

The Assemblyman also mentioned that if someone wants to take on a leadership position in the community, particularly on traditional council, rearing goats could be detrimental to their ability to participate in these community institutions. Breaking a traditional law may not have a significant impact on the day to day life of individuals in these continually urbanizing communities; however, it may inhibit someone from taking on a specific role that is locally significant. Interestingly, this may play a role in why a higher percentage of women took on goat rearing, whereas men did so to a lesser extent. Observing this gender disaggregated data on a community to community level would be necessary to suggest this pattern.

One participant indicated that she did not attend any organized meetings about animal rearing and that there were no extension services available in the community. When asked why she did not
attend meetings she replied that she did not know of any being organized. When made aware of the
meetings, she said she would be interested in attending if she had known about them. In this case, she
primarily consulted her uncle and husband for advice on how to take care of the animals.

Participants in Ayakomaso were split on both the availability of extension services and meetings
focused on animal rearing. Two respondents described meetings of APERL beneficiaries that get
together to discuss their animal husbandry practices. One respondent, although she was rearing pigs,
had been attending a group of community members who share resources and knowledge around goat
rearing:

“When the first batch received their animals I started to attend their meeting and they decided
to keep a goat farmers group. This was to ensure decrease in cost for vet services as the cost of
drugs would be shared by many.” (Interview, Ay.2.2.)

The other participant who indicated that she had been attending meetings about animal rearing
said that not only would she attend meetings in her own community but that she also went to the
meetings organized by extension officers in Dumasua.

Of the participants who responded that they did not attend organized meetings, one was raising
grasscutter and another was raising pigs. These respondents both felt that they had nothing to gain by
sharing information with other APERL members because they did not know of anyone who was raising
the same animal as them. However, one participant said that he hoped those rearing pigs could come
together to share information and resources:

“The drug in my hand cost 10 GC to buy but I have to inject them... But if there were a group of
people to rear pigs then we could come together and buy the medicine together, and it would
be cheaper. But I am the only one rearing pigs.” (Interview, Ay.3.1.M)

The other two respondents who did not attend organized animal rearing groups did not attend
them because they did not know of any that were happening with Ayakomaso. They both indicated that
there are no extension services available to them in the community.
Despite the popularity of MOFA and APERL-organized community meetings that occur regularly in Fiapre and Dumasua, K.I.4 discussed some of the drawbacks of organizing community meetings outside of these institutional structures. He explained that, when groups are formed from the ground up, issues of available money and resources arise, including the perception that such groups should be able to collect dues or provide financial support for its members:

“Any time we meet all the conversation is on money problems. And if no money comes in, the membership dwindles. And the payment of dues is very difficult...” (Interview, K.I.4)

During the ranking exercises, two ‘other’ benefits were identified during the ranking exercise: ‘animal offspring’ and ‘gifts.’ Animal offspring as a benefit was brought up twice and was viewed to have a different function than the initial animals. One respondent explained that she wanted to give her animal offspring to family members so they could start their own micro-livestock livelihoods. The other respondent explained that the offspring made it a self-sustaining enterprise that would continuously provide outputs. One respondent identified ‘gifts’ as a benefit of having the micro-livestock. The animals themselves, the meat, or the manure could be given to neighbours and friends as ‘in-kind’ payments or as a way to acknowledge special events. Both of these benefits can be understood as being important components of ‘community organizing.’ The exchange of gifts or ‘in-kind’ resources often play a crucial role in maintaining significant ties in the community, and may be an asset when an individual is later in need of a favour.

Although sharing some resources like unused medicine, fees for calling veterinarians, or knowledge via meeting in groups seem to be popular ideas and are commonly acted upon, some types of sharing in the communities is less appealing, particularly the sharing of a male animal for crossing and the donation of offspring to neighbors and family for the start-up of new animal rearing activities. When interviewed many of the interviewees indicated that they would cross their animals with a family member’s or friend’s male animal opposed to the one provided in the community by APERL. In almost
all cases, the individual would stop using the APERL male for crossing once they had raised a male to sexual maturity. This problem was brought up by a key informant from the MOFA Regional Office (K.I.3):

“They were each given two females and one male to the community. I told [APERL] this was not the best. It is not the male that determines when the female is in heat. So if farmer A’s animal is in heat, but the male is in farmer C’s pen then the animal will not be available for crossing. This is a technical problem right from the planning stage.” (Interview, K.I.3)

However, beneficiaries viewed this issue as being based more on issues of convenience and inter-personal relationships, including perspectives on trust, than on being a technical issue.

Distribution channels for the marketing of animals in the communities are reported to happen through a few main channels. The majority of those interviewed indicated that middle men, chop-bar owners and sometimes butchers will approach farmers they know that are raising animals to purchase a whole animal for meat products. Some of the beneficiaries, four female and four male participants, knew the contact information of individuals they could call when they were ready or interested in selling an animal. Five participants indicated that they would go to chop bars or restaurants to try and sell their stock. Despite this, half of the participants (n=8) explained that by initiating contact with someone interested in buying an animal, they would be lowering the sale price as they would be perceived to be in need of selling the animal or in need of money. A higher price is linked to being sought out for the sale of animals. Alternatively, the animal could be brought into town and sold to a butcher in the market; this, too, would result in a lower price compared to having someone come to their farm to request to purchase an animal. It was also emphasized by one participant that the whole animal would always be sold and that the seller would not take the animal to the butcher and then sell it in pieces.

**Gender Needs**

Within these roles, women can be said to have two main types of needs: practical and strategic. Practical needs are those which fulfill women’s ability to sustain their roles as functioning within the household and larger community. In turn, these practical needs result in specific kinds of benefits. These
benefits are mainly: economic and efficiency related and may require all of the four types of resources listed by the framework. Strategic needs exist within women’s triple role, as well. Much like practical needs, by meeting strategic needs, women gain a multitude of benefits, primarily linked to equality, equity and empowerment as discussed in the framework and throughout the study. Of course, the four types of resources are necessary to meet these strategic needs. Additionally, social, cultural and institutional changes are also required to meet women’s strategic needs.

**Practical Needs**

The data show that practical needs of women within the communities tend to involve the generation of income; providing culturally appropriate food sources for family members; and ensuring access to health care for family members.

Income generation was found to be at the forefront of study participant’s interest in micro-livestock rearing. Local markets are not yet oversaturated with animal products, and animal protein continues to be in demand. Furthermore, with the communities’ Muslim population, sheep play a special cultural role – animal skins are often used for prayers and during holidays. Ninety-two percent of female respondents indicated during the initial interview that income generation was their primary reason for engaging in micro-livestock rearing. However, when presented with intangibles during the ranking activity, some opinions varied slightly. Despite this, income generation was never far from the conversation at hand.

Using micro-livestock as a food source also came up during the initial interviews. Interestingly, 50% of women identified this as a main reason for engaging in micro-livestock rearing but 42% of women interviewed specified that they were either not interested in using the animals as a food source because it was not sustainable for the business, or because they did not like to eat the type of animal chosen. Nevertheless, the primary reason for not using animals for home consumption was that it was believed that by doing so, less money would be available for home use. A couple of women stated that
they would prefer to have the income and to spend it on animal protein as they needed, rather than use one of their own animals to provide animal products to the household.

Last, during the initial interviews health care provision for the family was brought up by a male interview participant. He explained that this was one of the primary reasons for wanting to generate income through micro-livestock rearing. Although no other study participants indicated that this was a priority for them during the initial interviews, health care as a major expenditure area showed up as the second most highly ranked ‘expenditure’ type during the ranking exercises. This holds true when disaggregated by gender.

**Strategic Needs**

Strategic needs of women within the communities start at home. The researcher found that the decision and high prioritization of children’s education was more of a strategic need than a practical one. Families often ensured access to education for their children, even in cases where their parents had prioritized farm labour or other household tasks over education in their own childhood. Many of the respondents indicated that by sending their children to school they anticipated that their children would be able to support them when as they aged. More important, however, study participants explained that their children, once educated, may help them to purchase land, develop land, or start or expand a business. Education was linked with higher earning potential and autonomy within the communities.

Education of children was found to be of highest priority amongst the majority of the study participants’ households. This was found both during the initial interviews with 58% of female respondents bringing up the expenditure of income on school fees of being high priority, and during the ranking exercises where it was ranked number one as the most likely area of expenditure of micro-livestock related income. Men and women interviewed showed a comparatively equal dedication to this ideal.
Other strategic needs, were expressed during the initial interviews, through the interest of women in business development (33% of women respondents), and land ownership (25% of women respondents). These numbers were higher during the weighted ranking exercise, in which the option was presented to those who may not have initially considered it. Two of the women who were interested in acquiring their own land had husbands. One of the women interested in acquiring land did not have a husband. One woman stated that she wanted to be able to leave the land to her children. Other women explained that they knew it was a good investment that would be profitable. Due to the traditional landownership patterns in the communities that typically favour men, these ambitions speak specifically to the betterment of women`s status, earning potential and autonomy.

Business development, with the expectation of being a primary income generator, was also interesting in terms of gender relations and the strategic betterment of women within the communities. Women interviewed were highly engaged with the idea of earning incomes that were comparable to those of men, and were hopeful in the diversification of their livelihoods and the investment into new income generating opportunities. However, business ideas were stereotypically female realms of work, i.e. tailoring clothing, preparing food, selling provisions, hair dressing etc. One woman shared her plan to build a storage facility where she could keep corn while in season, and then sell it to farmers during the season when corn is less available. This type of strategic planning for livelihood development was less well represented amongst the sample population.

Last, women`s investment in and enthusiasm for training and education opportunities are contributing to their strategic needs for improved equality, equity, and empowerment. During the initial interviews, one-third of the women interviewed (33% of women interviewed) demonstrated interest in receiving more training on not only their own micro-livestock species but on other types of livelihoods as well. It was also noted during the initial interviews that 42% of women were enthusiastic about training others who wanted to learn about animal husbandry either through the APERL program, or
from individuals in their community. Women saw this opportunity as potentially contributing to their role within their community and increasing their social capital.

**Gender Benefits**

By using the coding framework, the results from semi-structured interviews as to how beneficiaries decided to expend resources on developing their new livelihood, can illustrate decision-making patterns motivated by ‘benefits.’ Gendered benefits fall into five categories: economic, efficiency, equality, equity, and empowerment. Livelihood decisions about how to allocate resources (e.g. what type of pen to build, what materials to use, when to consult a veterinary officer, and whether to attend community meetings, how to allocate capital etc.), are often motivated by these benefits. More broadly, these benefits relate directly to the gendered needs and roles of the beneficiaries.

When analyzing the data, it is apparent that some of the decisions made were based on individual, practical, circumstances, e.g. the symptoms of animals upon their arrival, the absence or presence of a spouse for practical support, and others were made based on foreseen circumstances or long-term objectives.

**Economic**

One of the first economic decisions that beneficiaries had to make was how to construct their pens, what types of materials they were going to use, and where they would get them from. Many respondents living in Dumesua and Ayakomaso sought out scrap wood from the sawmill that is located between the two towns which helped to reduce the cost of materials. One participant said she used bamboo cut from a wooded area as a way to reduce costs. Obtaining scrap and second hand materials from neighbours, uncles, fathers, and husbands was the most common method of reducing cost. However, respondents commonly expressed the desire to be able to use concrete in their pens, as it was viewed to be the most sanitary and easily maintained building material. Beneficiaries were also taught at the MOFA training sessions that concrete was the best material to use for flooring in the pens. Lack of
funds and expertise were the most common reasons why respondents were unable to use concrete in their pens.

The MOFA training in animal husbandry also suggested that animal pens be constructed to have both a roofed area for sleeping and an enclosed unroofed area for feeding. Some beneficiaries were able to build this, but some indicated during the interviews that they wish they could afford to build their pens in that design. It was also recommended that concrete be used for feeding troughs for pigs. At the time of the interviews, multiple beneficiaries indicated that they wanted to relocate their pens, add additions, fix the roofing, or change building materials. As the micro-livestock grew in number, the beneficiaries were more likely to want to make changes to the initial pen. Pen costs were highest in Fiapre and lowest, overall, in Ayakomaso.

The majority of pens cost between 51 GC and 100GC or approximately 28-54 Canadian dollars (see Figure 4.5). The type of animal being reared did not appear to have an impact on cost of pen construction.

![Figure 4.5: Distribution of Pen Construction Costs](image)

The two individuals rearing pigs spent 30GC, and 60GC. The male with pigs spent more money on pen construction than the female. The woman raising grasscutters spent 70GC on wired cages for her
animal husbandry activities. However, she was keeping these wired cages within a larger shed that was
originally used for storage. This larger shed was not included in her calculation of the cost for animal
housing but she explained it to be pivotal to successful grasscutter rearing:

“The grasscutters are very hard to handle, if you don’t have them enclosed by a larger cage they
will run away when you’re handling them...They are scared easily, and this protects them from
being scared...They also like to be a certain temperature, not too hot or too cold...My husband
built this structure...” (Interview, AY.1.2)

K.I.4 explained that by using an already existing wall (i.e. one that encloses the home), a person
wishing to rear grasscutters may be able to reduce the expense associated with building a pen
substantially, while simultaneously fulfilling the need for an second enclosed space. The rest of the
“ideal” pen, according to K.I.4, should be constructed with concrete blocks and mesh wire. This
prototype of a pen would cost approximately 175GC. K.I.4 estimates that a wooden cage that functioned
in the same way would cost approximately the same amount of money but not last as long or provide an
ideal shelter for the grasscutters’ needs.

The four highest estimates for pen construction costs were all for goat pens in Fiapre. The cost
of acquiring land was not included in any of the estimates. All individuals interviewed either had land
that they could easily use, or borrowed land from family members.

Key informant (K.I.3) explained that for many of the beneficiaries, building a pen for the
intervention was not economical because in many cases buying two animal offspring can be less
expensive than constructing a pen:

“When you look at the cost of building a decent structure it is more expensive than two animals,
you see. You are spending so much on the structure, more than the animals given. If there was a
way to increase the number of animals [given], even if they had to pay [APERL] back, it is more
economical.” (Interview, K.I.3)

Another major expense, as identified by the study participants, is veterinary services and
vaccinations. The semi-structured interview participants were asked to give estimates of their
expenditure on veterinary services. Some respondents gave estimates based on a period of 2-3 months, some gave estimates over the duration of owning the animals, some gave estimates on a treatment to treatment basis with an approximation of how many treatments their animals have received, and some gave estimates based on monthly expenditure depending on how they conceptualized the expenditure. The researcher broke down the values to a month by month expenditure and can provide a rough estimate of associated veterinary costs.

![Figure 4.6: Monthly Average of Estimates for Veterinary Service Expenses by Community](image)

Highest monthly vet expenditure was reported in Ayakomaso, followed by Fiapre. Participants from Dumasua reported the lowest average vet expenditures. However, there was a high level of variability amongst the responses from all beneficiaries across communities. Estimated monthly costs ranged from 0GC per month to 20GC per month. Despite some reports of high expenditure on veterinary services per month, the majority of beneficiaries reported spending 1-10GC per month (n=10), with three respondents reporting that they have never consulted veterinary services, primarily because their animals never showed symptoms of being sick. Goats and sheep tended to have the highest cost for veterinary services reported by their owners. Those respondents with the three highest estimations were all keeping larger herds of animals, being some of the earliest recipients of animals
from the APERL project. Both respondents raising pigs reported that they spend approximately 9GC per month on vaccinations and other types of hygiene-related substances for pig rearing:

“But then I have to buy the soap for a bath to wash their bodies with medicine... The next thing you have to do is wash the animals every week and that is expensive. The medicine that I bathe them with costs money.” (Interview, Ay.3.1.M)

The one person raising grasscutters reported never having to contact veterinary services because the grasscutters had not demonstrated any signs of illness and therefore reported a monthly average cost of 0GC.

![Figure 4.7: Distribution of Monthly Average Veterinary Service Expenses](image)

None of the beneficiaries reported giving their animals vaccinations prior to observing symptoms of possible illness. The most commonly mentioned symptoms that led to consulting a veterinary officer were diarrhea and the abortion of unborn young by a female goat or sheep. These symptoms appear to be most common in goats and sheep. Two respondents indicated that they required veterinary services during abnormal births. One respondent told the researcher of a mother goat that had an infection in her udder and was unable to feed her young. The participant was unsure of whether to sell the female goat or not. At the time of the interview she had not yet consulted a veterinary officer and did not have any plans to do so. Another beneficiary reported that she had a goat whose tongue hung from the side of its mouth, that it had a lump near its leg, and that it was not
producing milk after pregnancy. In this case, the respondent had tried to contact the vet multiple times, and despite the veterinary officer indicating that he would come to treat the animal, he had not shown up. This respondent also indicated that she did not have the money to treat the animal even if the veterinary officer could show up and give a diagnosis of the illness.

Almost half (n=7) bought and kept medicine on hand for when they may need to consult the veterinary officer, as they reported it was less expensive to provide the veterinary officer with the medication than to have the officer provide it. Additionally, all respondents indicated that veterinary fees were divided by injection and medicine. The veterinary officers charge based on a per injection fee and a premium on supplying medicine. One participant said that veterinary officers charge for travel costs to their home or wherever the animals are kept and that it is possible to save costs by bringing the animal to somewhere that is convenient for the veterinary officer. No respondents suggested that they do this to save money. Another respondent said that she often shares necessary treatments with her uncle if he has already purchased the bottle of medicine required. In this circumstance, the woman is only required to pay the veterinary officer for administering the drugs.

This information is supported by an interview with an individual who works at the MOFA regional office (K.I.3):

“When you invite him [the veterinarian] to come you pay... the drug charge component and the service charge component...So if you have your own drug and invite the veterinary man then you pay the service charge component and the cost of transportation to your farm. But if he is using his own drug then he will add the cost of the drug as well...If you carry the animal to the [veterinarian] officer than the service charge is different...” (Interview, K.I.3).

K.I.3 also insisted that typically any trainees of MOFA’s programs are told not to administer vaccinations without the help of the veterinary officer, except in the case of de-worming medication.

The MOFA trainer (K.I.1.) who acted as a key informant during the study explained that most of the beneficiaries he encountered during training were uncomfortable with the idea of administering injections to the animals, and that more training (i.e. an additional four days), would allow participants
to gain the skills necessary to properly self-administer vaccinations to sick animals. The key informant described the training sessions as lacking practical skills application, and expressed interest in showing beneficiaries how to castrate animals, so they could do it themselves. Despite his concern about the training lacking practical skills development, he did explain that these practices were, at the least, shown to beneficiaries. Follow-up and monitoring of practices at the participant’s homes was also recommended by the key-informant to help pinpoint where beneficiaries are having difficulties and what types of training can be offered to mitigate problems that beneficiaries may be having.

General observations from the table include that Sunyani has the highest sale and purchase value amongst butchers, farmers, chop bar owners and ‘middle men’ for all micro-livestock species across the four communities. This suggests that when animals are bought and sold in the main town, they receive a higher price. In general, the two communities between Sunyani and the furthest community included in the study (Ayakomaso) have the lowest sale prices for animals. However, this changes slightly in Ayakomaso where the value of animals tends to rise again in comparison to the prices in Fiapre or Dumasua. This may be due to issues of supply and demand.

All of the animal species distributed gain value over their lifespan, particularly male adults not used for breeding purposes. In all cases, breeding females are less valuable than adult males intended for food consumption. Young of all species have initial value, and although it was reported not be common to sell young, it is an option when pens are overcrowded. This is particularly useful in situations where buyers are looking to breed animals as well. Sunyani consistently has higher sale values for micro-livestock species with Dumasua consistently having the lowest sale values for all of the species. This information can be used in combination with other data collected throughout the survey to generate suggestions about current market demand, profitability, cost in relation to expense, and distribution channels.
When observing the comparative market prices, it is evident that pigs are the most valuable micro-livestock species by the time they reach full growth (adult – eating stock). The breeding females are also more valuable compared to goats, sheep, and grasscutters. Comparatively, they do not require a more significant investment in terms of initial cost of acquiring young, which can be raised for profit. Pigs also appear to have the most discrepancy in terms of differences in value between breeding females and adult, eating stock.

Next, Appendix Four shows that goats and sheep are relatively close in sale and purchase value. However, goats earn slightly more profit in comparison to sheep. This may be related to goat meat being the preferred animal product for consumption across the communities. Grasscutters appear to gain the least value over their life span in comparison to the purchase price of young, at birth. On average, across the four communities, grasscutters will gain 31GC in value when sold as adult, eating stock. This can be compared to goats at 70GC, sheep at 61GC and pigs at 435GC. However, there are some discrepancies between the value of grasscutters at birth, as reported by the comparative market prices, compared to information provided by a key informant. K.I.4. once trained in grasscutter rearing by GTZ, and now acting as a trainer for them, reported that grasscutters can sell for up to 50GC at three months of age for breeding stock – considerably higher than recorded in the comparative market prices data. Whether or not they have a relatively small gain in value over their lifespan, grasscutters are still reported to be a viable and profitable livelihood option by semi-structured interview participants and key informants. This may be due to their high birth rate, young age of sexual maturity, and low input demands. On average, a grasscutter may have five pups per litter whereas goats and sheep average two births per litter, and pigs have an average of four. Other characteristics of grasscutters that make them an appealing livelihood option according to K.I.4 include their reputation as a delicacy in West Africa, the ability to house them in a small area, and the amount of available feed
sources from the household or on nearby land. He also suggested that grasscutters as being complimentary to other livelihood types including farming:

“At times, farmers can be handicapped in certain seasons [when] they don’t have anything to sell. A typical example is a coco farmer. After the coco is finished they are left until another season. But if a coco farmer adds grasscutter rearing to his business you see that it becomes another source of income, so that at a certain period they can sell some animals. You also see that old people who have retired might be rendered unimportant, but with grasscutter they can still make ends meet...They are also a good source of protein for the family.” (Interview, K.I.4).

Despite the many benefits K.I.4 raises, he also warned that grasscutter is a difficult and unsustainable livelihood without adequate training and exposure to appropriate animal husbandry methods.

Animal choices made by study participants do not show a gendered preference for specific types of micro-livestock. However, this may be due to the small sample size. APERL data show that women show a higher preference for goats (72% of female beneficiaries chose goats) compared to men (60% of male beneficiaries chose goats). Men have shown more interest in rearing pigs than women – seven percent of women and 16% of men opted for pigs. These types of decision-making patterns may be linked to likelihood to engage in risk taking behaviour, education, training, access to resources, and previous experiences. Differences in preferences between genders may also be linked to gendered roles and needs.

Table 4.6 APERL Records on Micro-Livestock Distribution by Community as of June 22, 2011

<table>
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<tr>
<th>Community</th>
<th>Number of Recipients</th>
<th>Type of Animal Chosen by Beneficiary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Fiapre</td>
<td>48</td>
<td>42</td>
</tr>
<tr>
<td>Dumasua</td>
<td>29</td>
<td>34</td>
</tr>
<tr>
<td>Ayakomaso</td>
<td>27</td>
<td>46</td>
</tr>
<tr>
<td>Total</td>
<td>104</td>
<td>122</td>
</tr>
<tr>
<td>Percentages</td>
<td>46%</td>
<td>54%</td>
</tr>
</tbody>
</table>
Nevertheless, the data on comparative market prices, suggest that market values may not be influencing the preferences of women, as pigs are typically more valuable throughout all stages of development. Prices for breeding females and adult males (eating stock) tend to vary amongst animal species. It was reported by semi-structured interview participants that male goats and sheep are, when possible, castrated in order to encourage weight gain and to help them retain market value. However, for goats and sheep, both adult females and males are similarly valuable, with adult males earning approximately 10-15GC more than a breeding female. This may have to do with comparative weight, or function (i.e. breeding females are less likely to be bought and sold for breeding or consumption purposes and are less preferable to adult males for food use). Male grasscutters, on average, are worth up to 25GC more than female, breeding grasscutters. Pigs show the greatest discrepancy in terms of comparative prices between breeding females and adult males. Adult, male pigs earn up to 500GC more than a breeding female would when sold.

They key informant interview with the Assemblyman in Dumasua, gives more insight as to why goats may be a more popular choice for women, even in a community where the rearing of goats is traditionally taboo:

“People moved into the community and started bringing in goats, one after another. The Chief and the elders had to tell the community again that the rearing of goats in the community is not
okay...but goats have a ready market. If you go to any chop bar they would rather buy a goat than a sheep. It is very easy to make money off the goats...Goats are more of a delicacy...You can sell them anytime you want money... Sheep are mostly for when people offer rituals or have festivals...” (Interview, K.I.5)

Motivators for choosing goats over more profitable pigs may be because of the already existing and well established market. Familiarity with the demand for and consumption of goats allow them to be perceived as a reliable investment of time and money, even in Dumasua where goat rearing is traditionally forbidden. The above suggests that decisions to invest in goats may be an economic one. However, a key informant at FFRT (K.I.2) suggested that pigs’ behaviours are “filthy” and that they are unclean:

“Most people think that pigs are very dirty and that they eat almost everything. So some people are not interested in the meat, because pigs eat feces. Muslims do not eat pig meat... a lot of our beneficiaries’ are Muslim and they prefer goats and sheep – especially sheep for cultural celebrations. These things are affecting the choices that are made.” (Interview, K.I.2)

This suggests that there may be some stigma associated with pigs related to health and hygiene that may be deterring the large spread growth of pork production. Additionally, K.I.3 reinforced perceptions echoed other places that pig, and grasscutter, cages are more relatively expensive compared to goats or sheep and that their management is more intensive:

“You see, taking care of grasscutter and pigs is labour intensive but with the sheep and goats the assumption is that if you release it to go it will feed and go back... And the cost for making the cage for grasscutter the cage is very expensive. The cage for the pig is also expensive compared to sheep and goats. With sheep and goat, the assumption is that they do not take much time. Grasscutter and pig need more care comparatively. But pigs is an area you can easily make money very fast, the marketing is there and they grow fast” (Interview, K.I.3)

Efficiency

Decisions concerning animal management, resource acquisition, and division of labour are linked to issues of efficiency. However, these areas of interest fall into other categories of the gender analysis framework as well. An interesting area of efficiency particularly relevant to individuals living in rural and peri-urban environments, and unique to the study communities is the interface between crop
and micro-livestock production. This area does not have a high prevalence of already existing animal raisers, and many of those who chose to begin to engage in micro-livestock production do not also farm. However, those who did indicate that they use manure to fertilize their crops or the waste from their farm to feed the animals are tapping into a potential area where a lot can be done to improve the efficiency of animal based livelihoods:

“It really makes the soil fertile. I grew some plantain on the farm and the plantains were very beautiful and nice, they grew very big so the manure is very important to me. Even now, immediately you sweep the manure and take it to the farm or immediately people will come to you and want it.” (Ranking, Fi.1.2)

Another use for manure, identified by participants, is to keep animals from eating seedlings and crops:

“We use feces to put on the crops, to prevent goats from eating the crops. I even have a sister that comes for it in the morning and uses it on her farm. When I do a little bit of farming, I use the manure also.” (Ranking, Fi.2.1)

A key informant (K.I.3) also discussed the many benefits of rearing micro-livestock for individuals who are already farming land:

“So at a point where your crop is ready to produce, you need some financial support to buy fertilizer but you don’t have the money but you have the animal. So, you sell the animals and you go and buy your fertilizer. Also, the farmer will have a lot of crop residue that can be used to feed your animals. Those who have [animals] in large numbers, they can use the manure for the crop production. Those who have livestock and crop interactions, they tend to benefit a lot. I was telling some farmers in the case of crop failure, you can rely on the animals. Because our crops depend on the rain and the rains can fail you. The animals play an important role to our farmers.” (Interview, K.I.3)

Essentially, he discussed the benefits of mixed-farming systems and the integration of animals into crop production. When doing so, K.I.3 was discussing issues of efficiency in developing a high functioning micro-livestock livelihood. This is important to consider in resource-strained environments. Similar sentiments and practices were repeatedly explained by participants in the study.
Equality

Equality in the framework analysis relates to opportunities for women to engage in livelihood realms that are traditionally dominated by men. While the literature and nature of micro-livestock rearing suggests that women have traditionally been involved in the raising of small animals, these micro-livestock interventions target women equally to men in these communities where livestock production is not widely taking place. By doing so, it is allowing leadership and innovation, in some cases, to start with women. It is also avoiding the stigmatization of the livelihood as being either ‘male’ or ‘female,’ as project documents suggest that there is relatively equal interest from both genders in raising micro-livestock.

Key informant (K.I.2) was asked about the role of women in micro-livestock rearing, and gave a positive response centered on the importance of providing new livelihood opportunities for women:

“With this training, gender was considered so we have a lot of women. When we help a woman to develop, you build a family because the women are very close to the children... In Africa, everything is about men...When you help women you help build a better society... Here at FFRT, it is helping the faculty too.” (Interview, K.I.2)

He also discussed his thoughts on gender equality in the Region, and how the APERL project impacted these issues:

“The women in these communities are very hard working. They are more hard working than the men. When the women decide to do something they act very seriously...There is no aspect in this project that women cannot do. One of the benefits of this project is that there is no discrimination against women. In terms of gender, [beneficiaries] it is almost one to one...When it is only men that are the beneficiaries, the man is taking control of the resources for himself...At meetings you can see more females than males...” (Interview, K.I.2)

Key informant (K.I.3) shared a similar perspective, emphasizing the success that women in the communities had been having in undertaking new micro-livestock livelihoods:

“The women do very well in feeding them; they are even doing better than the men. In terms of managing the animals, the women are doing better than the men. We have a situation that is like, everything in the house is for the man. Here we are lucky, some of the livestock belongs to the woman and they are taking good care of the animals. You know, these women also have farms, farms that they also take care of.” (Interview, K.I.3)
Equity

Access to the training activities provided by APERL, and the high prioritization of intangibles such as ‘sense of security’ and ‘social status,’ among study participants, demonstrate realms of the livelihood intervention that relate to issues of equity for women. When participants discussed ‘sense of security’ and what they meant by it, sentiments of independence, autonomy, and forecasting for the future were repeated by many of the women interviewed. These realms of the study pertain to issues of equity because they contribute to helping women gain access to the same opportunities as men may traditionally have in the communities.

In many cases, for women participants (n=7), the training on micro-livestock rearing provided by APERL was the first time since primary school that beneficiaries’ were able to participate in knowledge acquisition activities. Study participants reflected on this opportunity fondly, and the data show that by gaining the experience offered to them at the MOFA training institute, the participants felt confident pursuing the new livelihood activity. One way this is reflected is through the ‘constraint’ ranking activity, where knowledge was ranked seven out of nine, indicating that the vast majority of participants felt as though they had gained the knowledge necessary to be successful at animal rearing:

“Knowledge is the most important thing for me; it’s the benefit from the training. Knowledge is important to be able to keep your animals and develop them, so if they are sick you will know and you will know how to handle it... Without knowledge you would not be able to develop the business.” (Ranking, Du.2.1)

“It is knowledge [that is most important]. When [APERL] came again, I thought [the animals] were doing okay. But from the workshop, I realized that there are still more things to do... like budgeting, for example. This workshop was a refresher. Because I cannot read and write, it is difficult for me to remember these things but with the recent training it helped me to remember what I must do to take care of the animals.” (Ranking, Ay.2.2)

This type of training often led to APERL beneficiaries and non-APERL involved community members seeking out advice and information from the women who had participated in the events.
offered by APERL. Women reported sharing information, and enjoying having people come to look at
the work they were doing on animal husbandry:

“Yes lots of people come to find out how you keep your animals. Those of us who went for the
training are often engaged in conversations about the well-being of our livestock... I think it can
offer me opportunities because we learned a variety of thing about other livestock as well. The
manual that was given to us can also be of help when offering help to someone (Interview,
Du.1.1)

Furthermore, having women engage in non-traditional types of animal rearing that may be
perceived as higher risk is another interesting way in which improved equity between genders may be
observed. Grasscutters and pigs are of high economic value giving women the opportunity to generate
incomes that may be equal to those earned by men in other professions. In instances where participants
indicated expected earnings from micro-livestock, the data show that women do not expect to earn less
than the amounts quoted by men. It is particularly significant in cases where women self-identified as
the primary recipient of micro-livestock benefits. This type of decision-making appears to be strongly
linked with social status throughout the interviews. Many of the women explained that by engaging in
this new micro-livestock livelihood activity, people in their communities will respect them and come to
them for information. Improved incomes are another way women identified micro-livestock as
contributing to their status within the community:

“When I make money, my security will increase, and I see I will move from one stage of life to
another. People will recognize what I have. People will come and see that okay I have taken care
of these animals well.” (Ranking, Fi.1.1)

“Security and status in the community are best. When you are more secure because of finances,
people will respect you and you will gain socially, from that respect you will earn money and
with that money you can make more money.” (Ranking, Du.1.1)

As the above interview excerpts illustrate, security, social status and income generation are
closely tied together in the ways in which women in the communities conceptualize their own
independence and roles within the larger community. Over time, if women are able to strive for or
maintain control over their micro-livestock, they will continually build upon these initial roles as a resource for their wider community.

**Empowerment**

Movements towards equality and equity are important in laying the groundwork for women’s empowerment to take place. In order to measure whether the micro-livestock intervention is having an impact on women’s empowerment, some realms of the livelihood were explored. Women’s connections to information, decision makers, and technical services, and skills development opportunities are necessary in ensuring them the ability to compete economically with men in micro-livestock rearing as a livelihood.

Data collected show that women study participants tend to be less knowledgeable about community meetings, but more likely to attend them if they are aware of where and when they are being held. When asked, 42% of women indicated that they were attending animal husbandry meetings of some kind, whereas only 25% of men (or one respondent) responded that he was attending similar meetings. However, all men interviewed knew of animal husbandry meetings and specific individuals they could go to get advice. Of the seven women who were not attending any livestock rearing groups, the main reason cited was that they were not aware of them.

The interviews also indicated that women were less knowledgeable about technical services provided by extension agents and veterinarians, and how to market animal products, in comparison to men. Questions about marketing animal products showed a large discrepancy in how females and males were planning on broaching this realm of their micro-livestock livelihood. All of the men interviewed knew the contact information of someone within, or outside of their community that they could sell their animals to, whereas only 33% of women interviewed knew the contact information of someone who bought and sold animals within or outside of their own community. One female respondent explained that her father would be responsible for marketing the animals she was raising. The majority
of women were planning on going to chop bars and restaurants to sell their animals when they were ready to do so.

The interviews also suggest that women are more likely than men to rely on their partners to do financial budgeting. When asked, 58% of female respondents indicated that their husband, father or son (in absence of a husband), was in charge of managing their finances and the finances for the micro-livestock livelihood. Forty-two percent of female respondents said they were primarily or solely responsible for managing the finances associated with the micro-livestock livelihood. All of the men interviewed indicated that they were solely responsible for managing and controlling resources for the micro-livestock livelihood. In cases where women were receiving no financial management support from a husband or male family member, they were still likely to receive inputs from them. Types of inputs mentioned were land, money, construction materials, and experience.

Last, women report being reluctant to engage in traditionally male dominated activities so, for example, they are not likely to participate in constructing pens. Ninety-two percent of female respondents indicated that they received help in constructing their pen for the animals and, in many cases, they cited borrowing land in order to do so. Women stated that they hired labour for pen construction, consulted with their own family or their husband’s family to acquire help, or were assisted by their husbands, sons, or fathers. None of the men interviewed indicated that they solicited help for the construction of their animal pens.

**Gender Resources**

Resources as defined in Moser’s gender analysis framework include knowledge, land, labour and capital. Below, knowledge, land, and labour are discussed at length. Capital and the role as a resource it plays in micro-livestock development has been discussed at length throughout the chapter, including under ‘economic’ and ‘efficiency’ codes, as well as productive roles and practical needs.
Knowledge

Knowledge transfer, acquisition, and retention are vital components of the micro-livestock intervention designed by APERL. They are also pivotal to the successful uptake of new livelihoods and the betterment of women through autonomy and innovation. When observing the results from the data collected, key informants were able to bestow context as to how significant training programs were in the shaping of this intervention.

One key informant, from the MOFA Training Institute in Wenchi, indicated that the majority of beneficiaries were interested in receiving training on all of the livelihood types, despite knowing that they would only receive one species from the program. Participants also showed a high level of interest in learning about grasscutters, even in situations where they had opted to receive goats or sheep. There were concerns from the key informant that by allowing participants to receive training on four or more livelihood types, information may become confused over the long term and that relevant knowledge may not have been absorbed. However, there were discrepancies in training amongst three different groups. The first group of trainees were more likely to have received training on two or more of the livelihood options. The second and third groups of trainees only received lessons relevant to the micro-livestock species they had chosen to rear. Despite the key informants’ concerns about the volume of information being confusing, he did believe there was some benefit to participants learning more than one new type of livelihood strategy:

“We think they should be given more than one option so at least, when they are done, they can do two things...so they have an idea about when someone is talking about sheep or when someone is talking about grasscutter or when someone is talking about bees. But the time is limited so we are not able to talk to them more about it” (Interview, K.I.1)

In order for the training to be as effective as possible in achieving knowledge retention, the key informant suggested that the development and implementation of subsequent monitoring and training sessions developed and administered by MOFA and supported by APERL.
K.I.4, who had been trained through a grasscutter intervention developed by GTZ, also cited the lack of monitoring and evaluation as being particularly discouraging to farmers:

“...no information would reach the farmers to let them know if they are doing well or not. So at times, farmers are reluctant to release any information to these institutions because they do not see the need. After questioning them for information, and so forth, nothing comes to them anymore. To start with grasscutter is not a joke; even to get the housing you need money. The provision to get money is not there, and the Ministry of Agriculture is not paying much attention to grasscutter. They have their own interests... These are some of the challenges we are facing.” (Interview, K.I.4)

One way to estimate that amount of knowledge retained was be to observe the pens during field visits, and compare their construction to the way in which beneficiaries were advised to construct them through MOFA training and by field visits by the MOFA Regional Officer. Field photos and notes suggest that the majority of beneficiaries (n=13) did construct the pens as instructed by the MOFA training, MOFA extension professionals, and the APERL staff. Only one participant did not follow all of the advice given – her pen lacked the enclosed entrance that is recommended for feeding and vaccination. This may have been due to lack of resources, land (as she explained that she was restricted by a water drainage path used by her community), or, perhaps, adequate knowledge.

In his interview key informant (K.I.3) explains recommendations that were made for beneficiaries when constructing their pens:

“We expect a room where they are house in the night or when it’s raining, and then there should be a yard where they are fed during the day time or to carry out activities such as castration or vaccination. At night, it should be locked...Pen’s should not be housed in the kitchen or the living areas of the beneficiaries.” (Interview, K.I.3)

This general design necessary for grasscutters was explained by a former trainer, trained by GTZ (K.I.4):

“The housing should be composed of two things. A complete house, and inside the house you construct the cages so that the animal will be safe. If there is no proper housing, anytime the grasscutter gets down it will escape” (Interview, K.I.4)

This exact design was followed by the interviewee raising grasscutters, indicating that within the standard training program this design is encouraged not only by APERL and MOFA but by GTZ as well. It
is important to note that the beneficiary trained in grasscutter rearing was able to successfully imitate the structure recommended to her with a high degree of accuracy and quality.

The bulk of formal advice for pen construction was delivered through the MOFA training institute, and the training materials provided to beneficiaries (written in English). These manuals suggest that pens for sheep and goats should have good air movement and not be fully roofed; have approximately 0.5m squared of per animal; flooring should be made out of sand or concrete; the building should be made of concrete clay, brick, wood, or bamboo; appropriate roofing materials are thatch, plastic, or corrugated metal; feed and water troughs should be provided; forage should be hung, and not touch the ground. The materials suggested are inexpensive and locally accessible. It was observed that beneficiaries used the materials suggested. However, floors were usually mud. Furthermore, the researcher did not observe any constructed troughs. Food was provided in bowls or hanging from the roof of the pen.

The MOFA training manual for grasscutters recommends that housing is made of concrete blocks, wood, or wire mesh cages. The document also emphasizes the need for grasscutters to be sheltered from the rain, heat, and cold. It also suggests that the cages be built in an area that is not damp. A cage 0.13m squared is suggested for nine adults. The researcher only observed one grasscutter cage built by an APERL beneficiary – this cage included all of the advice suggested in the manual, but offered an exterior cage as well that functioned in order to ensure that grasscutters could not escape when having their pens cleaned or being fed. The researcher observed two other farmers’ grasscutter cages that also followed the recommended model in the manual. This may suggest that the recommended type of housing is accessible to individuals within the community.

Guidance on how to construct an appropriate pen for pig production was lacking detail in the training manual. However, it was recommended that it have concrete floors; that they are fenced in and have a lock; and that troughs be constructed for feed and water. The study participants raising pigs did
not use the recommended materials (i.e. concrete), nor were the pens designed to provide shelter from rain or sun. They were also both lacking feeding troughs. However, in each pen adequate separation and space was considered for the anticipated growth of their micro-livestock production.

Strong networks within the community were identified by the key informant as one of the most important aspects of ensuring that information is retained, used, and shared. He believed that information needs to be shared amongst the beneficiaries and the larger community, but also between MOFA and the extension workers. The key informant (K.I.1) believed that in order for either the trainers at the MOFA training institute or the extension workers to be successful, communication must occur between all three groups of stakeholders. Another key informant (K.I.2) also mentioned the need for ongoing support and training for beneficiaries by the MOFA trainers:

“Because they have given the training and from time to time they should be visiting the farmers to see if they are practicing what is taught. No one has ever done that.” (Interview, K.I.2)

In the ranking exercise, knowledge of animal husbandry practices scored 11 points and was not seen to be a constraint (i.e. participants felt as though they had adequate knowledge to rear the animals successfully). Many of the participants referenced the training at Wenchi, indicating that they had learned what they needed to know in order to raise the animals.

Despite participants’ indicating that they had received the training and knowledge necessary for micro-livestock rearing, the lack of willingness of participants to vaccinate animals suggests something different. The results from the interviews shows that the majority of respondents across the communities did not administer vaccinations (n=12), although many (n=11) indicated that they had been shown how to do it at the Wenchi animal husbandry training. There did not seem to be any differences in men’s vs. women’s willingness to administer vaccinations. Despite this, all respondents expressed their ability to provide the animals with de-wormer medication based on the animal’s size. This, too, was demonstrated to the participants during the Wenchi animal husbandry training. Unwillingness to
administer vaccinations may be related to lack of experience, perceptions around the appropriateness of administering vaccinations, confidence, and the lack of clear examples or thorough training.

However, this lack of training may also be related to the lack of vaccinations of animals prior to the demonstration of illness. This is cited as another component of the livelihood in which adequate knowledge and education is vital to the success of the animal’s development. This is interesting, as the ranking exercise shows a high level of concern about disease on behalf of the beneficiaries. A key informant (K.I.3) insists that farmers are unwilling to vaccinate animals prior to them showing signs of illness:

“If you take the vaccine of PPR [to livestock producers], nobody will mind you. They will wait until [the animals] are sick. But you can’t treat [viruses] once they have it, you can only manage the symptoms. They will call you once they are sick, but the best is to prevent it through vaccination, but the farmers will not do it before they are sick. It means a lot of education is needed for the farmers.” (Interview, K.I.3)

K.I.3 believes that it is not disease that is the constraint in itself, but rather the misinformed management of the animals that is causing disease to be an issue for the beneficiaries:

“The diseases are also there, but to me it is about management. Because we have all of the vaccines available to prevent most of the diseases that kill the animals, but the farmers are not ready for that but if they are educated then we can make head-way. If you ask them, they will say disease is a major problem but it is our own management. If you have good housing, good feed, good management then you can improve upon the incomes of these farmers.” (Interview, K.I.3)

The data from the study also suggest that knowledge may impact decision-making around which types of animal to rear. A key informant from FFRT at KNUST explained that impressions about the management of unfamiliar species acts as a deterrent to engaging in unfamiliar animal types. Grasscutters are commonly believed to be a species requiring intensive management and are easily impacted by variables like weather and temperature exposure. In comparison, goats and sheep are seen to be hardy, robust and adaptable. He also discussed that management of these species involves
decisions about range management practices, as to how animals will be fed and to what extent they are able to forage.

Traditional practices in the community have always relied on a mixed system of varying compositions of free range practices and the use of pens, sometimes referred to as ‘semi-intensive’ management. In situations where other species require more intensive types of feeding by being restricted to confinement, the animal becomes less desirable to beneficiaries. He listed advantages of free range practices being: less time required for gathering forage; less cost associated with feeding. Disadvantages were: theft; endangerment from vehicles, people, other animals; and consumption of contaminated feed. He stated the lack of access to resources and capital for the majority of beneficiaries makes zero-grazing practices both impractical and undesirable. He also expressed concerns about possible disease outbreaks as herds of animals begin to become larger.

Introducing micro-livestock to an area where livestock rearing is not widespread, presents barriers in terms of knowledge and perception. K.I.3 suggested that without adequate examples of successful livelihoods that rely on livestock as an income source, it is difficult for beneficiaries to fully commit themselves to developing their herds. K.I.3 believes that as a result of adequate information and exposure, people in the communities tend to see livestock rearing as a hobby instead of a full-time livelihood option:

“The farmers see livestock production as a hobby...When an animal dies, they do not see it as a cost they see it as a dead animal. But it is a cost. It is money that is lost... We are trying to educate them on the important role that the animals play. And hopefully they can improve on the incomes” (Interview, K.I.3)

Adequate knowledge for APERL beneficiaries is suggested by study participants to be a bigger issue than training of participants in the micro-livestock intervention. Technical capacity locally, regionally, and national policies all impact the support networks available for subsistence and small-scale livestock producers. Another key informant (K.1.2) indicated that a lack of technical capacity,
including a lack of veterinarians was an issue in developing micro-livestock livelihoods. From his perspective, the veterinarians who do exist in the area of overwhelmed with people requesting vet services for their animals. He recommended that the APERL project should hire and support a veterinary officer to give routine care to APERL beneficiaries’ animals every three or four months.

Other issues revolving around technical capacity include appropriate support from government agencies to support small-scale animal rearing practices:

“MOFA’s involvement in grasscutter does not show up properly. The Ministry of Agriculture does not have a clear cut policy for us; we are left to operate on our own.” (Interview, K.I.4)

K.I.4 also discussed that attempts to create a grasscutter rearing association outside of MOFA, have failed due to the availability of opportunities to generate funds for the group and the lack of reliability of members and staff:

“If we cannot train anymore, we do not have the money to run the office. The office is there, all of the equipment and computers are in place but we cannot operate.” (Interview, K.I.4)

Furthermore, K.I.3 from the MOFA regional office also discussed issues in technical capacity including the education system and training opportunities within Ghana’s livestock sector:

“When you also look at our agricultural sector most of our training is on crop production. So, most of our officers from the agricultural college do crop production. So they only talk to farmers about crops, not livestock. So, they see livestock as something separate from crop production. They see it as something for veterinary officers. However, there are not enough vets to be everywhere. Therefore, the person at the district level needs to be a broad based person...In the region here, if you want to count the graduates that are animal scientists are not up to 10...So when you go to some of the districts, someone with crop background or general extension is the person put in charge of livestock...But it becomes difficult for them to get the right information at the right time.” (Interview, K.I.4)

**Land**

During the ranking exercises, land was not found to be a major constraint from the perspective of beneficiaries. However, some responses from participants in the interviews, and information from key informants suggest that the issue of land availability for animal raising in the communities is complex.
During the ‘expenditure’ ranking activity, ‘land ownership’ was the third highest ranked priority for the use of new income generation, coming only after school fees and health care. Women (n=6) were particularly hopeful about being able to purchase land for farming, business ownership, animal rearing expansion, or to hold as an asset. Examples of women’s plans for land acquisition are diverse and were largely discussed during the ranking activity:

“I would want some land so that my children have somewhere to stay and if my Mom came to live with me, I want them to have somewhere to stay in the future. I wouldn’t want it to happen that there is no way to stay.” (Ranking Activity, Du.1.2)

“There are lots of benefits to owning land. If you have your own land you can build on it or you can rent it. Either way, you can make money from it. The money you can make from rent is good, but building is also good (Ranking Activity, Ay.1.1)

This level of interest in land may be related to its high value, and women’s optimism about gaining more autonomy by participating in a highly respected new livelihood activity.

An example of the high pressure on available land can be seen in the relationship between micro-livestock raising and crop farming. The general sentiment within the communities is that raising small types of livestock requires less land than fruit and vegetable farming. Key informant (K.I.2) discussed the differences between integrating fruit trees into farm practices, and introducing micro-livestock species. He explained that micro-livestock tend to have larger returns in terms of income generated, and can provide these returns faster than fruit trees which take longer to grow and become valuable:

“There are more problems with those raising the trees than with the animals. Because, those with the animals know that after one year they can sell. But they know trees take so many years. An advantage with the livestock is that you only need small land. The same amount of land that is used to grow two trees can be used for all of your animals...Land is very big issue” (K.I.2 Interview).

When asked about the acquisition of land and opportunities to own land, one key informant (K.I.2) explained that some people are interested in buying land but there is not any land to buy.
Urbanization was cited as a major contributor to the lack of available land for farming and animal rearing. He said that people with land would rather sell the land to someone who wants to build a house than farm it. Lack of foresight, ability to plan for the long term, and poverty were cited as some of the factors contributing to this phenomenon.

One respondent, during the ranking activity, brought up the issue of urbanization stating that it made letting his animals free range challenging:

“...if there weren’t so many houses I could open the goats to free range and they would come back. But now when people are cooking, the goats will go looking for cassava peels around the house. People come with reports because of the behaviour of the animals, or they chase them away...” (Interview Ay.2.2.M)

Another man indicated that he had built his pen for the pigs he received on land owned by the Catholic University. He indicated that they had told him they could build there any time and that he would have to relocate his pens. He felt as though he had no other land available to him that was suitable for the pigs, as he believes that it is unsanitary to keep pigs close to the home. When asked if he could keep his pigs on the land that he farms, he responded that the rate of the animal theft was too high for him to keep them so far away. In this example, the participant was restricted in the development of his livelihood as a result of the unavailability of land.

Despite these examples and participants’ high interest in acquisition of land, land was not identified as one of the most prominent constraints during the ranking activity. ‘Land ownership’ was ranked 5th out of seven possible options. Participants felt that land could be easily acquired if needed for animal rearing, largely by “borrowing” land from family members or negotiating land use amongst their social networks.

Herd management is another realm of micro-livestock rearing that was presented to be problematic as a result of dedicated land use was decisions (i.e. whether the animals would be free-range, zero-grazing, or a combination of the two types). Many beneficiaries expressed concern about their animals being harmed by neighbours (n=5) or traffic (n=3), which may be a result of higher density
populations in communities and living in close proximity to roads. Participants in Dumasua highlighted that because their fruit and vegetable market is in the centre of town, animals often go there to find food and disturb those who are selling their goods:

“There are some complaints. Initially, [the neighbours] did not complain. But this time around, they are complaining [the animals] go to the market and that causes problems. People have to chase them away from the market. It is one place that I wouldn’t want [the animals] to go.” (Ranking Activity, Du.1.1).

“People come with reports because of the behaviour of the animals, or they chase them away. That is a hazard, because of the market... If there weren’t so many houses you could open the goats to free range and they would come back. But now when people are cooking, the goats will go looking for cassava peels around the house” (Ranking Activity, Du.2.2.M)

As a result of these issues, some participants indicated that they try to keep their animals penned as frequently as possible:

“People might complain if you open them and allow them to free range. But I keep my animals in the pen more often. If they are open, then I am feeding them or I am around. They normally don’t go out” (Ranking Activity, Du.2.1)

Land availability generally, and appropriateness of land for animal rearing more specifically, may be related to the above-mentioned concerns.

**Labour**

Labour plays an interesting role in the livelihoods of those living in the three study communities. Labour was not identified to be a significant constraint in terms of micro-livestock development. In fact, micro-livestock development is perceived by study participants not to require a large amount of labour input as compared to farming. One participant, specifically, explained that raising micro-livestock requires less labour than farming, and that he looks forward to doing it as he continues to age. He believed that this intervention was ideal for older community members who may be unable to farm due to age and health (Ay.3.1.M). When labour was mentioned by participants, it was in reference to using income to hire labour for their farms. This is reflected in the ‘expenditure’ ranking. Farm labour was
included in this ranking activity because it was brought up by some interview participants during the initial interview as being an ambition in terms of developing their farms. However, even once this expenditure option was presented to all interview participants, it ranked low in comparison to other needs and ambitions. It was ranked 6th out of a possible eight ranks. However, it was ranked equally to business development. This may be because farm labour may be conceptualized by some study participants as being one specific example of business development, as farms are commonly explained to be businesses and a high number of study participants (n=10) were engaged in some level of farming.

**Summary**

This chapter outlines the results of the study and presents the data collected through tables, charts, and interview excerpts. The data has been organized by code, as identified and outlined in the coding framework. The results illustrate that women and men share commonalities in their prioritization of resources and their motivations for becoming involved in APERL’s micro-livestock intervention. However, some discrepancies in ability to acquire and mobilize resources, access knowledge, and utilize technical support services exist. Despite this, a high level of enthusiasm from the women participants is noted in learning new skills, connecting with new networks, and developing new livelihoods. As illustrated, the key informants provide important contextual information and insight into the institutional structures and cultural phenomenon that may be driving some of the differences apparent in men and women’s livelihood choices. The next chapter will extract the key information from the results section and present it in a way in which the data becomes useful for micro-livestock intervention design, policy planning, and institutional change.
CHAPTER FIVE

DISCUSSION

Introduction

This chapter discusses the research findings in relation to the conceptual framework and, in particular, Moser’s gender analysis tools. Additionally, it links the findings with the relevant literature on gender, decision-making within rural households, capacity building, and livestock as an agroforestry technology as discussed in Chapter Two. The discussion chapter explores the themes based in the findings as they relate to the conceptual framework and relevant literature to enhance the understanding of micro-livestock interventions as they relate to women’s livelihood development in the Brong-Ahafo region of Ghana.

The Moser’s gender analysis tools (1989) that were adapted and applied to this study was useful in organizing the facets of women’s lives in rural, developing communities. The framework is well designed for conducting gender analyses of projects. However, it has also shown to be a useful tool in exploring how an intervention contributes to the practical and strategic needs of women. Because of design, the study shows that the framework can also provide important context for understanding knowledge transfer and acquisition processes. Furthermore, the study shows that the framework functions well within the context of an interdisciplinary project with multiple objectives and actors. Project planners are becoming increasingly aware of the value in assessing how an intervention is influencing women’s ability to not only develop their livelihood, but do so in a way that is meaningful and relevant to the community in which they live. This recognition has led to the need for tools that accurately measure how an intervention may contribute to a woman’s needs within the multiple roles she carries. When adapted to new projects, this framework can continue to be used in the future to explore in what ways a project contributes to practical and strategic needs, multiple roles, the benefits it produces, and what resources are needed to support the livelihood. By implementing these tools
proactively, projects planners can identify the successes and weaknesses of the intervention in contributing to women’s livelihood development.

This study identified numerous factors that may impact the long-term sustainable development of micro-livestock livelihoods for women in the Brong-Ahafo Region of Ghana. These factors are sometimes technical, institutional, social, or cultural. In all cases, there are opportunities to leverage those realms that have been particularly successful, or address those areas that seem to be problematic.

The first research objective was to document the practical and strategic gender needs of women rearing micro-livestock within the project communities. Next, the research aimed to identify the contributions that micro-livestock livelihoods make to satisfying practical and strategic gender needs of women by using an adapted application of Moser’s gender analysis tools. Finally, the study sought to understand how livelihood and animal husbandry training contributed to current capacities of women within the project communities. The findings show that the micro-livestock intervention is reasonably well situated to provide women with skills, training, and resources they can use to meet practical needs, and that some components of the project are well structured to begin making progress towards using micro-livestock rearing as a tool to improve gender equality, equity, and empowerment. Furthermore, the research shows that training and knowledge transfer can be pivotal in this process. Barriers that were identified were often found to be due to institutional and technical capacity issues, and to be rooted in social and cultural norms. The rest of this chapter will explore some of the main emerging themes in detail.

**Capacity Development for Women’s Empowerment**

Understanding the needs of the women within the project communities, as they relate to their livelihood decisions, is vital in implementing and maintaining interventions that address the priorities of women (Kettel, 1993). The study shows that micro-livestock livelihoods are well suited to meet women’s practical needs within the project communities, particularly in situations in which a woman is engaging
in more than one income-generating activity. Micro-livestock contributes to women’s practical needs in the project communities by providing a direct food source; by providing an income generating activity; by providing goods that can be traded for services as in-kind payment; by facilitating relationships through the procurement of gifts; and by supplying animal by-products that can be useful for those women who keep home gardens or farm. These acts of support and exchange are important in moving women towards establishing autonomy within their networks (Kettel, 1989).

In terms of meeting strategic needs, the study shows that the development of new micro-livestock livelihoods contributes to these long-term goals that improve women’s status relative to men. Strategic needs identified by women participants include further education and livelihood training; improved networks within and outside of their communities; business development; land ownership; and the education of children. Micro-livestock contributes to these long term goals by providing specialized knowledge and experience that is highly regarded in the project communities. The training provided by APERL has also led to the strengthening and creation of groups that identify as being similar due to their engagement in animal rearing or their desire to do so. Group formation is a vital component of improving the capacity of women, and moving towards processes that facilitate empowerment (Khan and Bibi, 2011). The study shows that micro-livestock also contributes to women’s strategic needs by acting as an asset. Livestock should be understood as a non-traditional saving strategy that is more accessible to woman than structured, formal financial services (Paxton, 2009). More importantly, however, these assets function to give women a sense of security that is achieved through a multi-faceted approach to improving the capabilities of women through training, and securing them status in the community that is gained through engaging in a respected income generation activity.

The recognition of these strategic needs, and the women’s desire to build on these experiences are significant because they challenge the notion of ‘patriarchal bargains,’ that often lead to women
being reluctant to engage in activities that may change their socio-economic position (Sharp et al., 2003).

APERL-related training has often improved the participants’ perspective of their own well-being which has led to the desire to be active in more training and learning opportunities, or to provide training to others. Income generation through micro-livestock has allowed women to envision what they will do with any extra funds they accumulate. Aspirations to improve their already existing business, invest in a new business opportunity, or to save to acquire land were all mentioned repeatedly by study participants. This interest in the creation of autonomous income-generating activities on behalf of women participants is intrinsically valuable in the process of social change that allows for improved gender equality and women’s empowerment (Brinkerhoff and Morgan, 2010)

However, the study shows that women are restricted in developing an autonomous and cost-effective livestock livelihood as a result of gender norms. This trend is found throughout the literature on women and livelihood development (Kettel 1995, 1996). The results of this study show that women more commonly than not rely on their husbands to organize and facilitate land, pen construction and the management of finances. The results also show that women have less developed professional networks that come from being integrated into the public sector. For example, women often mentioned that their husband had connections that made it easy for them to access cost-effective options for construction materials, masonry professionals, carpenters and veterinary officers. It was not apparent that these connections could be accessed by the woman independently from her husband. It is important to note that these behaviours may be a result of the ‘gendered division of labour’ often discussed in the rural livelihood literature.

Certain activities, based on the role of a gender within a culture, are deemed as ‘male’ or ‘female’ and societal expectations may restrict an individual for acting outside of these limitations (Razavi and Miller, 1995). These, sometimes, negotiated roles are observed in the project communities
to limit the extent to which women can act in ways to fulfill their long term strategic needs. Indeed, the literature supports the finding that women beneficiaries are restricted in developing their livelihoods due to the ‘intra-household’ division of labour (Fletschner and Mesbah, 2011). Men typically have higher social status, and therefore better negotiating power, due to their perceived role in productive labour and their connections both in and outside of the community. Information relevant to women’s livelihood development may not be shared within the household (Fletschner and Mesbah, 2011).

The study shows that when women are confronted with a lack of available inputs, capital, and credit at the beginning of the livelihood development process it is likely that the beneficiary will borrow resources from people within their network. This typically results in them later will ‘owing’ the loaner of resources any gains made from the original investment in the livelihood. This obligation is detrimental to the beneficiary developing an autonomous livelihood that is not rooted in loans or social obligations to family members, neighbours, or friends. This type of behaviour may create patterns of indebtedness inhibiting the long term sustainability of the livelihood. As a result, women’s knowledge of, and access to, financial institutions and market prices needs to be enhanced in order to develop effective livelihood strategies (Fletschner and Mesbah, 2011).

Interviews with men suggest that they are more likely to administer vaccinations and drugs to the animals on their own and that women typically prefer the assistance of a veterinary officer, despite the fact that all beneficiaries received the same training. This pattern, too, makes women more reliant on the availability of veterinary officers in the communities. The results indicate that this not always a reliable option for community members. This findings also suggests that women may associate more costs with livestock rearing than men, due to having to procure support from individuals with technical expertise more often (i.e. veterinarians, carpenters etc.). This finding is supported by the literature on intra-household decision-making that speaks to the common occurrence of women being unable to
access information that may make their livelihoods more effective and efficient (Fletschner and Mesbah, 2011).

Data from the study’s findings on household financial management suggests that women are likely to share financial decision-making responsibilities with the men in their household. Similar trends that favour men’s ability to control financial resources are commonly found in literature on the negotiation of roles within the household (Fafchamps and Quisumbing, 2003). Men interviewed during the study were more likely to make financial decisions independently from the other members of their household. When asked, women participants often stated that their husbands or a male family member were managing the money for the micro-livestock livelihood. While not evident in the study, literature suggests that the member of the household who controls an asset is most likely to use that resource in their own interest (Nujki et al., 2011).

Although a small sample of men were interviewed, no male respondents reported sharing or delegating financial control of the micro-livestock to their wives or female family members. Women also commonly replied that their husband may have budget for managing the micro-livestock but they were unsure. Very few women indicated that they kept a budget when keeping micro-livestock, but some indicated that they knew there were benefits to doing so, including determining a reasonable sale price based on the expenses of inputs per animal. Not only is this trend of giving up the opportunity to manage finances associated with the intervention not helpful in terms of improving gender equality, equity, and empowerment. The literature also suggests that this situation results in less money being spent on the household (Nujki et al., 2011; Paxton 2009).

Studies on rural household decision-making have shown that when women have control over resources within the household, they are more likely to be spent on the welfare of children including school fees and culturally appropriate food (Paxton, 2009). This trend was not apparent during the study’s ranking exercise (i.e. men ranked food and health care as highly as women); however, it is
evident that the trend of women not controlling the livestock assets within the household results in the disengagement of women with the financial management component of the livelihood.

The study does not shed light on to whether women engaging in micro-livestock are more constrained in terms of having to stay close to the home. This suggests that the research does not provide adequate insight to determine whether women’s productive or reproductive loads are reduced by engaging in micro-livestock rearing. This is significant, because literature suggests this is necessary in order to improve women’s capacity (Khan and Bibi, 2011).

Literature on types of livelihood development that contributes to women’s strategic needs suggests that women need to be supported in engaging in income-generating activities outside of the home (Khan and Bibi, 2011). Otherwise, the livelihood activity is only reinforcing an already existing ‘gendered division of labour’ (Reeves and Baden, 2000). It was expressed by male respondents that micro-livestock rearing is well suited to women because of their role within the household, their easy access to household food waste, and their ability to acquire help from children or elders within the home. This suggests that micro-livestock rearing close to the home may, in some ways, reinforce gender expectations. Despite this, when combined with training and regarded as a novel and/or specialized livelihood, livestock rearing may lend special status to women as knowledge keepers, allowing them a special status and function within their community. This is particularly significant in the context of the study because an overwhelming majority of respondents indicated that they are interested in acting as trainers or knowledge sharers to help other people engage in micro-livestock rearing. In fact, most of them indicated that they would want to engage in these practices for free with no economic motivation. This interest may lead to the initial trainees becoming an important generational resource if livestock keeping continues to remain popular.

Leveraging women’s engagement and interest in developing micro-livestock livelihoods will be necessary in order to ensure that micro-livestock continues to contribute to both practical and strategic
gender needs over the long term. Literature shows that men often take over women’s livelihoods when they are proven to be financially viable (Valdivia, 2000; Tipilda and Kristjanson, 2009; Njuki et al., 2011).

In order to protect women’s investment in developing these livelihoods, steps need to be taken to empower them within their decision-making, their households, and their larger community. The study suggests that community support and respect for women engaging in micro-livestock rearing already exists. However, whether this support impacts a woman’s bargaining power within the household is unknown. By continuously engaging women in on-going animal husbandry training, financial management, and budgeting techniques, APERL or other supportive organizations can help to improve women’s awareness about the benefits of being engaged in finances. This type of training is also important when a woman is the head of the household. In these situations, where no support exists for financial decision-making, it is crucial that women be educated on how to manage costs associated with livelihood development. Financial training and autonomy in financial decision-making are understood in the literature to be another component of development necessary for increased capacity (Khan and Bibi, 2011).

Additionally, implementing training on carpentry, masonry and other non-traditional trades for women may not only help women become more autonomous in their livestock livelihoods, but also increase acceptability of women engaging in these trades. It is this type of change from gender norms that is needed to work towards the empowerment of women. CD literature encourages the development of technical capabilities as being a key agent in facilitating change within the enabling environment (Brinkerhoff and Morgan, 2010).

**Strategic selection of animal species for maximum benefits**

Animal selection can have important impacts on both the household use of animal products, income generating potential, and the role the care-taker will have in the community. When beneficiaries choose an animal species that provides culturally appropriate food and animal by-products they can
acquire the most benefits from their micro-livestock livelihood (BOSTID, 1991). However, some participants were unable to articulate why they chose the animal species they did. Some study participants stated that they did not like the taste of the meat of the animal they chose. This choice is comparatively less strategic than choosing a animal species that is perceived to provide adequate food, therefore contributing to household food security, as well as providing income generation activities.

Within the project communities, it was found that practicing Muslim beneficiaries are more likely to choose sheep over goats due to the religious significance of sheep. Furthermore, the study shows that those participants who identify as Muslim are not found to choose to keep pigs due to their cultural taboo. This decision of Muslim beneficiaries to choose sheep can be understood as strategic, as sheep can play an important cultural role during religious festivities, and act to increase social capital. Additionally, by-products such as sheep skins can be an important resource for creating prayer mats. It is important that these different cultural associations be kept in mind during the planning and implementation of a livestock intervention.

Goats and sheep can be understood to be traditional types of livestock. Within the context of the study ‘traditional livestock’ can be understood to mean those species that were being kept in the project communities prior to the APERL intervention. In some cases, a study participant’s family members may have kept the same species of animal in the past. ‘Non-traditional livestock’ types are those species that have been newly domesticated (i.e. grasscutter) or were not commonly found in the project communities prior to the intervention (i.e. pigs). Those individuals who chose to engage in non-traditional livestock rearing can be understood as innovators or ‘first users’ (Diederen et al., 2003), within the context of the study. Traditional and non-traditional types of livestock both present unique benefits and challenges within the context of the study.

It was found that those rearing traditional livestock types were more likely to have individuals within their social network that had experience raising the same animal type. It was common for
participants’ parents or family members to at one time have kept sheep and/or goats. This experience was found to influence the beneficiaries’ decision on what type of animal to rear. Education, experience, and the availability of information are found in the literature to impact the adoption of a new innovation, suggesting that these elements are motivators for the uptake of new livelihoods (Wozniak, 1984). The impact of exposure to animals as a predictor to the type of animal chosen by a beneficiary can extend to non-traditional animal types as well (Wozniak, 1984). The study suggests that having observed someone raise the same animal species in the past led to increased knowledge and awareness about disease, management practices, and resource expectations. However, in some cases it led to less flexibility on behalf of the beneficiary in terms of disease management, pen construction, and range management.

Some participants felt more comfortable imitating the practices of those they knew with animals rather than adapting them to the local environment (e.g. peri-urban vs. rural), or following guidance given by the MOFA trainers. These social drivers are found throughout more recent literature on innovation diffusion as an explanation for why individuals may choose more familiar livelihood options (Heffernan, Thomson, Neilson, 2008; Dierdan et al., 2003.) However, this may be limiting when traditional practices are not suitable for increasing urbanization and increased population density, or in cases in which significant progress has been made in disease treatment, vaccinations, or range management. Exposure to animal rearing through family and social networks can be beneficial in providing a solid foundation for understanding the steps to take in the animal rearing process. As mentioned above, these animals have the added benefit of already being culturally engrained, and significant in terms of the multiple functional roles they serve in community life.

It was assumed that it is less common that those who chose to engage in non-traditional animal raising had a close contact within their social network that had also raised the same animal (Diederen et al., 2003). However, the sample of those rearing non-traditional animal types is too small to determine
whether this would be true. In one case, the female study participant who chose to rear pigs, was previously exposed to her brother’s pig farm. She indicated that this exposure had an impact on what type of animal she chose to raise. In the case of the participant interviewed who chose grasscutters, the beneficiary had been exposed to a successful grasscutter farm near her home. She indicated that she received advice and encouragement from these individuals, but that they were no longer operating within her community. These examples are cases of ‘early adopters’ as opposed to ‘innovators’ as a result of their exposure to these animals in the past. However, as an early-adopter there are specific benefits from engaging in non-traditional livestock types (Diederén et al., 2003). As a result, they possess unique and specialized knowledge that is highly regarded in the project communities and they have access to an undeveloped market where there is high demand and a short supply, making their choice a good economic investment.

Innovators and early adopters may also face barriers in technical expertise, veterinarian expertise, and difficulty finding trades people who can build pens to the recommended specifications, as shown through the study and supported by the literature (Heffernan, Thomson, Neilson, 2008; Dierdan et al., 2003). Additionally, finding individuals within their communities that can support them with advice and resources may be a challenge. Last, as indicated by interview participants, group formation for early adopters has been difficult. Inadequate communication between those engaged in these non-traditional types of animal husbandry has led to disconnect between these individuals. These types of barriers to innovation in agricultural systems are found throughout the literature. In particular, case studies by Pant and Hambly-Odame (2009) show that knowledge transfer systems and the integration of expert knowledge are vital to successful establishment of new innovations. Furthermore, a study conducted by Wright (2011) in the Sunyani District also found that women entrepreneurs were restricted in their innovation process by their status within their community and their ability to allocate resources to their project of interest. Although these barriers exist in the study communities, all of those
interviewed expressed a strong interest in sharing resources, experiences, and knowledge amongst a group of pig producers or those rearing grasscutters.

Different micro-livestock species present different needs in terms of veterinary services and, in particular, vaccinations. The study suggests that goats and sheep experience illness, aborted births, and death more frequently than pigs and grasscutters. A key informant supported this claim and pinpointed a number of routine vaccinations that needed to take place in order to deal with those viruses and bacteria that are present in the region. Some reasons given for grasscutters and pigs having less reported illness and death may be related to: confined management (zero-grazing), which limits the animals exposure to other animals that may carry disease; confined management that acts as a quality control in terms of exposure to pesticides or toxins in the environment (e.g. through plants, or the consumption of waste); management style in regard to the construction of pens and recommended separation of animals leading to a reduction of aggressive behaviour causing death or abortion. Early-adopters tend to recognize the specific needs of the non-traditional animal species, and recognize the risk and responsibility of engaging in these practices. This knowledge may lead to beneficiaries carefully following guidance and advice given to them, due to their lack of previous experience, leading to more successful initial establishment of the micro-livestock livelihood.

Lastly, the value of livestock must be taken in consideration when livestock interventions are designed. Economic incentives have long been understood as a primary motivator for innovation and early adoption (Heffernan, Thomson, Neilson, 2008; Wozniak, 1984). Despite the majority of participants indicating that grasscutters are more valuable than goats or sheep, the data collected on comparative market prices did not confirm this opinion. In fact, grasscutters, sheep, and goats are relatively comparative in price and gain value similarly over their lifespan. Not enough is known about veterinary care for grasscutters, as a result of the study, to determine whether they require relatively the same investment of money for these services. However, all other costs appear to be similar.
Pigs have significantly higher gains in value over their lifespan in comparison to these other species. They are also more valuable at birth in comparison to sheep, goats, and grasscutters. For this reason, they may be seen as a more economically valuable type of micro-livestock. However, they do require more expensive pens and care in terms of hygiene. Pigs may also be inaccessible to individuals living in high population density areas without additional parcels of land that are situated far enough from dwellings to meet community expectations of health and safety. Acquiring land that is easily accessible, yet far enough away from the homestead to be deemed ‘safe,’ may be difficult for beneficiaries of a similar intervention.

It was generally perceived unwise to keep animals too far away from the home for fear of theft. In comparison, grasscutters are particularly well suited for high population areas as they are kept in cages with anywhere from 4-20 grasscutters per cage, depending on the age and sex of the animal (MOFA Training Documents, 2011). These cages can be stacked and even built onto an already existing wall within a housing compound (MOFA Training Documents, 2011). In areas where participants expressed concerns about animal theft and injury, this species presents obvious benefits compared to sheep, goats, and pigs.

Innovation and Animal By-products

The study shows that participants are primarily utilizing micro-livestock for income generation, meat products, animal skins, and manure. BOSTID (1991) states that micro-livestock present an array of opportunities to producers including by-products, breeding stock, meat products and other intangibles (e.g. increased knowledge of animal husbandry) that can be exchanged for cash or in-kind. The study confirms that micro-livestock is, indeed, relevant in the ways suggested in the literature. However, opportunities to further diversifying the use and market for animal by-products need to be explored and important examples are emerging from the APERL project.

In many cases, the APERL micro-livestock intervention was the first time the participant had been exposed to animal husbandry. Many of the beneficiaries had never raised livestock in the past. This
presents a unique opportunity to promote innovation and improve the value chain of animal products, as very few preconceived ideas of the role of animals in the communities exist. Improving the value-chain of animal products allows women to remain competitive amongst each other as micro-livestock becomes more established within the communities. The use of manure on crops, the function of goats and sheep as weed suppressors, and the use of sheep skin are some of the ways beneficiaries are diversifying the role of the micro-livestock. These uses are good examples of how micro-livestock can be used as tools in agroforestry (Asfaw and Agren, 2007).

The APERL Baseline study shows that community members had a strong interest in integrating livestock into their crop systems (APERL, 2008). While some individuals are practicing this integration, as shown above, the majority of the study participants are not utilizing their micro-livestock in this way. Further training on how to develop, refine, and market these already existing uses would be useful for sharing knowledge between beneficiaries on these products that are already in demand. Research into the feasibility of promoting goats and sheep for milk, cheese, and other dairy products; supplying tanneries with goat, sheep, and pig skins; and the use of goat and sheep manure as a fertilizer or animal deterrent on food crops should be considered when assessing the potential of micro-livestock to contribute to the local economy. The use of sheep and goats for milk, manure, skins occurs in countries throughout Western and Eastern Africa (ESGPIP, 2012). There is a demand for some of these services within the communities themselves. However, even more opportunities may exist in Sunyani (often visited by project beneficiaries), or in Kumasi which is a considerably accessible city centre from the project communities.

Understanding the potential for innovation and creating an enabling environment where it can take place is critical to leveraging the ways in which micro-livestock may be contributing to practical needs and extending it to facilitate empowerment processes. Innovation facilitates empowerment by allowing a sense of ownership, capability, and transformation on behalf of the individual (Pant and
Hambly-Odame, 2009). This approach is particularly important to consider when understanding how the APERL micro-livestock intervention is contributing to women’s empowerment.

**Institutional Change to Support Small Scale Micro-Livestock Rearing**

Cornwall (2003) argues that the societal and structural basis on which women are excluded from decision-making processes need to be addressed before any kind of sustainable movement on women’s empowerment can be accomplished. The study shows that at present time there are no national policies to support small-scale livestock rearing. Nor are there specific government programs to aid women in subsistence income generation outside of the home. In regard to livestock, very little policy focused on supporting the development of this trade exists. Ghana’s national policies largely focus on crop production, and provide incentives where crops are large scale. Although, MOFA Ghana is structured so that there are regional offices, with extension officers who work at the municipal level and report trends to the regional office, this service does not seem to be adequate in terms of addressing issues that may be rapidly occurring. Evidently, institutional change needs to occur by incorporating the perspectives of the ‘users’ of animal technologies, and by situating these perspectives in the local context (Morgan, 2005).

Due to the government focus on crop production, universities focus on training and building expertise in crop science as well. This emphasis has led to Ghana’s technical expertise to lie within crop production. This choice is problematic due to rising demands for meat protein, and the demonstrated interest of rural and peri-urban dwellers in establishing livestock-rearing businesses for food supplementation and income generation. The Brong-Ahafo Regional District Officer expressed concern about these trends and emphasized that an interdisciplinary approach to crops and livestock needs to be adopted. He also felt that extension workers needed to be trained as generalists with equal ability to support both crop and livestock production. Additionally, active extension workers need to be trained to provide some basic veterinary services as there are not enough veterinarians to support an increase
in animal keeping within the project communities. This training would allow for an understanding of interconnected events on the behalf of those responsible for creation of relevant policies and those providing in-field support, as recommended in the literature for institutional change (Hope, 2011; Morgan, 2005).

Furthermore, national and regional governments could provide incentives to students to train in animal science or veterinary medicine. Study participants indicated that it was difficult to access veterinary services, and that extension workers were generally not available within their communities. This deficiency implies a need for a more effective system that ensures regular and relevant support from MOFA professionals in the region. Veterinarians and extension workers who do exist in the region are primarily male. Incentives for females to continue education in these fields should be encouraged as a way to change the ‘gender identity’ (Cornwall, 2003) of livestock production as predominantly male.

Other key informants expressed the need for monitoring of trainees who have passed through the MOFA Wenchi Training Institute. This institute was in place in the region prior to the beginning of the APERL project, and yet no monitoring of those trained at the institute appears to have taken place, including non-APERL trainees. As a result, it has been difficult for staff to determine what areas of the livestock training programs are effective and which ones are not.

**Summary**

This chapter situated the research findings within the conceptual framework, based in Moser (1989) gender analysis tools and the literature discussed in Chapter Two. By doing so, the discussion aims to provide answers to the research objectives: documenting the practical and strategic gender needs of women, rearing micro-livestock, within the project communities; identifying the contributions that micro-livestock livelihoods make to satisfying practical and strategic gender needs of women; and understanding how livelihood and animal husbandry training contributed to current capacities of women within the project communities. The discussion highlights that micro-livestock, indeed,
contributes to women’s practical and strategic needs in important ways. In fact, the study shows that micro-livestock interventions, when combined with livelihood and animal husbandry training, contribute to women’s needs in ways that other types of development interventions may not (i.e. jewelry making, weaving, tailoring etc.). In the project communities, micro-livestock provides culturally appropriate food sources, acts as an important resource during festivities, hold cultural significance, and provide valuable income generation opportunities (amongst other advantages).

More important, the chapter shows how the intangibles associated with the livelihood development are highly prioritized and valued by study participants, and that it is these benefits that are improving gender equality, equity, and empowerment. By facilitating institutional change, and understanding the processes of innovation and technology adoption, a more supportive environment can be created to help women create economically, socially, and environmentally sustainable livelihoods. The final chapter discusses in more detail the recommendations for further project development, steps to take to support institutional change and the considerations that need to be made when including women in future micro-livestock interventions.
CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction
This chapter summarizes the study, provides conclusions relevant to the study’s objectives, and gives recommendations for further research.

Final Summary
The study used an adaptation of Moser’s (1989) gender analysis tools to understand the potential for micro-livestock livelihoods to contribute to the practical and strategic needs of women in the project communities in the Brong-Ahafo Region of Ghana. The research sought to identify the practical and strategic needs of women in the communities, how micro-livestock was contributing to them, and the role of knowledge transfer in securing benefits and broaching constraints. A focus on Moser’s gender analysis tools allowed for a detailed understanding of the complexities of resource availability, gendered roles, and the impact of knowledge on micro-livestock rearing. This research used a variety of qualitative analysis methods including key informant interviews, semi-structured interviews and weighted ranking exercises with male and female beneficiaries, participant observation, document analysis, and a review of market prices at the time of the study. The field work was conducted from April 2011 to August 2011 in the three “Agroforestry Practices to Enhance Resource-Poor Livelihoods” (APERL) project communities of Fiapre, Dumesua, and Ayakomaso in the Sunyani municipality of the Brong-Ahafo region of Ghana. The methods chosen for this study aimed to ensure a depth of understanding of both practical and social phenomena influencing micro-livestock livelihoods. Furthermore, they aimed to be participatory in nature and to provide data that could be used to inform future micro-livestock interventions.
Main Conclusions
This study investigated the potential for micro-livestock to contribute to resource-poor women’s practical and strategic needs. Women in the project communities face constraints in developing sustainable livelihoods that generate income and contribute to goals of gender equality, equity and empowerment. This study shows the potential for carefully implemented livelihood development to enable women to meet short term needs while simultaneously improving autonomy and access to resources including intangibles such as community knowledge, social status, and security. The conclusions in this chapter review the important themes that have emerged from this research.

Micro-Livestock Development in Changing Rural Environments
The interest in micro-livestock rearing in the project communities was extraordinarily high. Furthermore, the limited exposure of individuals in the project communities to small-scale livestock is surprisingly low, given the integral role that livestock commonly plays in rural communities of the resource-poor. One reason for this low level of exposure may be related to the associated expense of keeping animals. Implementing animal rearing interventions in these communities is important for improving food security and income generation opportunities. It also will prepare communities for a growing demand of animal protein products, increased population density, and changing demographics. Demand for grasscutters and pigs has grown out of preference for the wild counterparts of these species and the preference for the domesticated supply of these meat products is expected to continue to grow. This is especially true as rural areas continue to urbanize. By supporting investment in micro-livestock, development organizations and governments can help rural dwellers adapt to changing lifestyles and resource uses as communities continue to change.

Practical and Strategic Needs
This study, and Moser’s (1989) gender analysis tools, functioned well in identifying the varying needs of women in the project communities. It was found that there is a complex relationship between the practical and strategic needs of women. Even more interestingly is the interdependence of these
needs within women’s multiple roles. The research found that practical needs are those which fulfill women’s ability to sustain their roles as functioning within the household and larger community. In turn, these practical needs result in specific kinds of benefits. These benefits are mainly economic and efficiency related and may require a number of resources to be available including capital and knowledge. By meeting strategic needs women gain a multitude of benefits, primarily linked to equality, equity and empowerment as discussed in the framework and throughout the study. Like practical needs, a number of resources are necessary to meet these strategic needs. Additionally, social, cultural and institutional changes are also required to meet women’s strategic needs.

The primary practical needs of women interviewed in the project communities were found to be the generation of income; providing culturally appropriate food sources for family members; and ensuring access to health care for family members. Strategic needs of study participants were determined as education and knowledge acquisition (as demonstrated by the high prioritization of children’s education and the commitment to animal husbandry training); business development; land ownership; social status; and feelings of social and economic security.

When micro-livestock rearing is combined with training opportunities and the promotion of group collaboration it functions to meet all of the identified practical and strategic needs in some way. Needs that were directly met by rearing livestock include food security and income generation. The training offered by APERL contributes to fulfilling the desire of women to highly prioritize learning. The training also functioned to encourage awareness about the benefits of budgeting, saving and investing which was well represented by study participants. APERL practices more broadly have contributed to group formation. Last, livelihood development contributes to the need for social and economic security, as well as improving an individual’s status within the community.
Resources

The study found that women in the project communities engaged with the micro-livestock rearing intervention often rely on their husbands to facilitate the access to and use of land use, pen construction, financial management, and connections with professionals and tradesmen. This reliance was found to be detrimental to the creation of an autonomous livelihood or to improving the gender position of the woman involved in regard to empowerment, improved networks, and effective knowledge acquisition and transfer. This is problematic because women have a complex set of practical and strategic needs within their varied gender roles. In order to sustain these needs in the short term while simultaneously addressing long-term needs, women need to be able to acquire assets, feel secure in their decision-making, and be respected by the networks they depend on for advice and support.

Intra-household Decision-Making

Livelihood decisions about how to allocate resources (e.g. what type of pen to build, what materials to use, when to consult a veterinary officer, and whether to attend community meetings, how to allocate capital etc.) are often influenced by intra-household dynamics including the productive, reproductive, and community organizing roles the beneficiary already holds. These roles may influence to what extent a beneficiaries’ husband, family, and neighbours are involved with developing the livelihood. The study shows that when a beneficiary receives support, resources, capital, or relies on another individual for the organization of finances, they are apt to lose partial or complete control over the asset. This loss of decision-making power largely undermines the efforts of the intervention to encourage women’s development. Central to the development of women’s livelihoods is the increase of capacity to be self sufficient and autonomous in their ability to access information and generate income. In order to do this, on-going training and support in animal husbandry, pen construction, budgeting, and financial management must take place in conjunction with the distribution of resources to help establish a new livelihood.
Supporting Innovation in Micro-Livestock Rearing

Motivations for choosing traditional vs. non-traditional micro-livestock types must be understood in order to cater training and resource support for beneficiaries choosing to engage in animal rearing. Understanding these choices leads to insight into how the livestock will contribute to the individual’s well-being, what the recipient’s long term goals are, and the social and economic value they place on animals. Livestock can be significant in acting as an asset, a food source, a primary income generation tool, or as a hobby. Additionally, the potential for the use of animal by-products can be shaped by the initial motivations for engaging in livestock rearing. Further research into the potential uses of animal by-products in the region needs to be undertaken. The promotion of innovation with animal by-products is encouraged. The study shows that there is potential for growth both in the marketing and rearing of the four animal species types, but also in the use and development of by-products. This work may be pivotal to the long-term success of micro-livestock livelihoods.

Recommendations

Recommendations emerging from the study are multi-faceted, and require an integrated approach to strengthening capabilities of beneficiaries at the local level; building institutional capacity within the Brong-Ahafo Region and Ghana; improving awareness of issues that may arise in micro-livestock interventions at the donor and project planning level; and for strengthening future research. In particular, when micro-livestock interventions are designed to improve the economic and social position of women additional measures must be considered. By implementing recommendations at each level, a holistic approach can be taken to understand the challenges and opportunities for micro-livestock interventions.

For APERL

The APERL project is in its final stages of implementation and no further distribution of micro-livestock is scheduled to take place. As a result, recommendations for the APERL project are limited. However, one recurring theme amongst key informant interviews was the need for the on-going
monitoring and assessment of the training component of the intervention. Those involved in the training of beneficiaries should be supported in visiting the communities and observing the animal husbandry practices of those trained. Conversations with trainees must also take place in order to determine what information has been retained, where beneficiaries are struggling in relation to their livestock livelihoods, and whether more training or additional resources are needed. At present, no monitoring of this type has taken place. By funding the MOFA animal husbandry trainers to visit the field and acquire a deep understanding for where their training was effective and where it needs improvement builds valuable institutional capacity, while simultaneously allowing beneficiaries an opportunity to provide input into future training and access support during the establishment of their livestock livelihood.

As the project begins to phase out, APERL should also consider implementing a ‘training of trainers’ program. An overwhelming majority of study participants indicated their excitement and hope to share the knowledge they gained about animal husbandry to other people in their communities to help them develop successful animal livelihoods. By training those trained to share train others, local capacity in animal husbandry is gained and shared in a sustainable and meaningful way. Other development organizations, such as GTZ, have used this method in the region for their grasscutter projects. From interviewing one of the GTZ trainees, it is evident that these programs can spark self-sustaining animal associations and the on-going sharing of knowledge. This measure will help to preserve the lessons learned at the Wenchi Training Institute. It will also preserve the efforts of the MOFA Wenchi trainers, group formation, and inform the long-term care of micro-livestock. This should be implemented prior to the phase-out of the Project in order to allow for the funding of the resources and facilities needed to establish a self-sustaining training program.

For Institutional Change (Policy Recommendations)

A multi-tiered approach to improving institutional capacity for support of small-scale micro-livestock rearing needs to be undertaken. At the time of the study, no policies focused on supporting small-scale micro-livestock enterprises existed. In fact, almost all of the national agricultural policies
focused on large-scale food crop production. Policy has had many implications including: shaping Ghana’s technical agricultural expertise to be focused almost solely on food crops; influencing the types of programs and classes available at university institutions; and affecting the training and management of extension agents at the local level to be largely geared towards crop agriculture. As a result, the number of veterinarians and individuals graduating from animal science programs is considerably low given the significant role livestock can play in improving food security and generating income. For these reasons, policies that support small-scale and subsistence micro-livestock need to be created at a national, regional and local level.

Nationally, funds need to be allocated to equipping regional offices with the capacity to deal with the growing interest in animal rearing within their districts. Additionally, scholarships and funding should be available for the development of technical expertise in animal science and veterinary medicine. It will also require that regional extensions workers are trained in a way that ensures support for the interconnected relationship of crop and animal production. It would also be ideal if extension workers had an understanding of basic animal husbandry, and the implications of animal and human health.

Tighter monitoring and regulation of the delivery of extension services must also take place, as many study participants indicated that no extension services were available despite their living in rural communities. With these changes in place, some funding should be allocated to be used in the development of, and support for local animal rearing associations. This funding will encourage the sustainable local development of animal-based markets while improving food security in rural and peri-urban areas. This funding could also be used to provide meeting space, resources to acquire knowledge, vaccinations for animals, travel, and credit.
Last, capacity should be built by grassroots organizations and development interventions to support on-going formal and informal learning opportunities for individuals interested in animal rearing to learn basic animal husbandry skills.

For Future Livestock Interventions

Livestock interventions are present throughout the region and are supported by a number of different organizations including the branch of the German government concerned with international development (GTZ), the Ghanaian Ministry of Food and Agricultural (MOFA), and the African Development Bank (ADB). Different schemes have been used in order to both create a commitment to the success of the livelihood on behalf of the beneficiary while simultaneously providing additional resources and support that would otherwise be available. Examples of this include the grasscutter intervention led by GTZ that started in 1999 which required beneficiaries to contribute half the cost of four female and one male grasscutter. GTZ would then provide training and the other half of the cost of the grasscutters. However, the beneficiaries still had to construct the pen themselves with no additional financial support.

Another example is the joint initiative between MOFA and ADB in which nine female sheep and one male sheep were given to a beneficiary. Here, the recipient would raise the animals for two years, and 10 offspring would be taken at the two year point and distributed to another beneficiary. In this scenario, the beneficiary was still required to accumulate the necessary funds and resources to construct the initial pen structure. Similar to the APERL project, requiring the beneficiary to contribute initial funds to building a pen presents issues of accessibility of the project, particularly for women.

While some financial commitment on the behalf of the beneficiary can create more sustainable livelihood development, the added technical nature of pen construction seems to limit the ability of the most resource-poor beneficiaries to participate in these programs. It also reinforces the need of women to rely on family members to help access the necessary capital, and provide technical skills and labour. Additionally, pen construction was often found to require more capital that the purchasing of two to
three small sheep, goats, pigs, or grasscutters. As a result, future livestock interventions should allocate funds that are accessible to beneficiaries through loan programs, and assist beneficiaries in acquiring labour for pen construction through the project. This assistance will help to eliminate the reliance of beneficiaries on family members during the construction phase of the project. Alternatively, beneficiaries, particularly women beneficiaries, should have access to opportunities for training on carpentry, masonry, and animal husbandry (Mann, 1990; Chen, 1984). This training will contribute to women’s strategic gender needs by providing supported opportunities for women to engage in activities that are not traditionally viewed as women’s tasks, while simultaneously providing them activities to engage in outside of the household. Doing so may also reduce the higher costs women associate with pen construction.

In order to increase the uptake of non-traditional micro-livestock species that provide opportunities for market diversification and are often in high demand by local consumers, risk-averse attitudes need to be addressed. Micro-livestock interventions must provide opportunities for beneficiaries to secure capital via low-risk loans, combined with on-going training opportunities, and the support for knowledge transfer through group formation amongst those rearing non-traditional micro-livestock types.

Veterinary care for animals and technical assistance for those engaging in micro-livestock rearing must also be improved. Access, reliability, and affordability are all factors that deter resource-poor individuals from seeking out veterinary care when necessary. By not doing so, an individual’s commitment to micro-livestock rearing is undermined and significant loss of resources, time, and capital is likely. Livestock interventions should secure veterinary service providers regionally, nationally, or internationally to provide routine vaccinations and checkups during the ‘start-up’ phase of a livestock livelihood. The funding organization should consider paying for these scheduled visits in the short term to help establish the beneficiaries’ income generation or a subsidization scheme to make this support
affordable. Nevertheless, a veterinary service should be provided soon after the animals are distributed to ensure that the animals supplied are healthy and remain so.

Veterinary care should be provided at intervals of four months over the next year to help acquaint the beneficiary with the different life cycle stages of the animal and the type of services and care that may be necessary during these times (i.e. pregnancy, birth, disease outbreak etc.). Not only would this provide the functional role of ensuring that all necessary vaccinations are distributed, but it would also serve as a knowledge sharing opportunity. Additionally, reliable access to veterinary care can support empowerment through problem-solving for animal health.

Project design and implementation should consider the reluctance of resource-poor individuals to provide preventative vaccinations for bacterial and viral infections that are prevalent in the area such as PPR and Q-fever. These vaccinations should be provided by or subsidized by the donor organization. These vaccinations should be administered by veterinarians to the distributed animals in front of the beneficiary soon after they are distributed. By doing so, the vaccinations would educate the farmers about the risk of these viruses and/or bacterial infections that may affect their animals and the value of preventative vaccinations. PPR and Q-fever may also have negative effects on public health as they can be transferred from animals to humans. By providing vaccinations, the donor organization is protecting the health of the communities and helping to reduce associated negative impacts of having animals close to human dwellings.

**Recommendations for Future Research**

Research into the market opportunities and benefits of traditional vs. non-traditional types of livestock is needed. Motivations for animal species selection, uses, and profitability based on innovation theory may yield insight as to how to further develop micro-livestock livelihoods from subsistence production to an income generating opportunity that enables individuals to save, invest, and further acquire assets. Value-chain analysis for animal by-products and a detailed market analysis, based in the discipline of economics, may contribute to a better understanding of the long-term potential and
growth of these initially established livestock livelihoods. A better understanding of demand for different animal by-products such as sheep skins, manure, goat or sheep milk etc. needs to be understood.

Furthermore, it would be beneficial to APERL, the MOFA Wenchi Training Institute, and beneficiaries if there was a better understanding of how knowledge from current training practices is being remembered, shared, and applied. Understanding knowledge retention of a primarily illiterate population will help to inform how training should be designed, implemented, and disseminated. At present, it is unknown whether the strategies the APERL Project and the MOFA Wenchi Training Institute use are effective. In order to determine whether knowledge is being retained and applied, monitoring of training sessions, review of materials, interviews with trainers, and verbal questioning of trainees will be necessary. It is also recommended that the observation, in the communities, of the application of animal husbandry techniques taught at the training institute take place.

**Concluding Remarks**

Ensuring that development interventions provide equal opportunity for both men and women to succeed is vital to the long-term sustainability of rapidly changing rural and peri-urban communities not only in Ghana’s Brong-Ahafo region but also, more broadly, in the global South. In societies in which women are restricted by culturally engrained social norms, special considerations must be made in order to allow women to choose to engage with a development intervention. In order to allow these interventions to positively influence women’s livelihoods, access to resources, capital, and training must be designed in ways that are sensitive to women’s multiple roles and needs. To do this, gender analysis of the intervention should be conducted at the planning stages of the development intervention. As this study has demonstrated, gender analysis can be used as a planning tool and is useful throughout the project implementation for reporting, monitoring, and evaluation.
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Agbo, B.P. *Restoring Crop Productivity in West Africa: The Potential of Agroforestry*. Centre for Agriculture in the Tropics and Subtropics, Filderstadt, Germany.


APERL Project (2008) *Baseline Study of Three Communities Involved in the Agroforestry Practices to Enhance Resource Poor Livelihoods Project in the Sunyani District of the Brong-Ahafo Region Ghana*, Kwame Nkrumah University of Science and Technology and the University of Guelph


APPENDIX ONE

LIST OF SECONDARY DOCUMENTS USED IN DATA ACQUISITION

APERL Project (2011) Data on Micro-Livestock Distribution in Project Communities, Kwame Nkrumah University of Science and Technology

APERL Project (2011) Gender Livelihood Planning Workshop for APERL Project Participants, Kwame Nkrumah University of Science and Technology

APERL Project (2010) Gender and Socio-economic Analysis of APERL Project Participants–Workshop Survey distributed to individual respondents, Kwame Nkrumah University of Science and Technology

APERL Project (2009) Livelihood Implementation Plan – Training of Trainers Workshop, Kwame Nkrumah University of Science and Technology

APERL Project (2009) Livestock Manuals (Grasscutter, Pigs, Sheep, Goats), MOFA-Wenchi Training Institute, Ghana

APERL Project (2008) Baseline Survey of APERL Communities - Questionnaire for Individual Respondents, Kwame Nkrumah University of Science and Technology

APERL Project (2008) Baseline Study of Three Communities Involved in the Agroforestry Practices to Enhance Resource Poor Livelihoods Project in the Sunyani District of the Brong-Ahafo Region Ghana, Kwame Nkrumah University of Science and Technology and the University of Guelph
APPENDIX TWO

COMMUNITY ENTRY SCHEMA

Introductions to Canadian Project Directors → Meeting with visiting KNUST faculty → Arrival in Ghana → Contact with UoG researchers in the field.

Introductions to Professors at KNUST and FFRT → Interviews with KNUST Faculty → Collaboration with National Student Personnel on APERL Activities → Referral to other Relevant Stakeholders in Agriculture and Livestock

Formal Introductions to Community Leaders → Selection of a Research Assistant

Community Meetings with Project Beneficiaries → Recruitment of Study Participants
APPENDIX THREE

INITIAL SEMI-STRUCTURED SURVEY TOOL FOR STUDY PARTICIPANTS

1. Tell me about your micro-livestock (i.e. goat, sheep, pig, grasscutter).

2. Do you think having a _____ (goat, sheep, pig, grasscutter) has benefits over other types of small stock?

3. What do you use your micro-livestock for?

4. Are you a farmer? If not, do you have other sources of income generation?
   a. How does having micro-livestock impact your feelings of security during bad crop seasons or the dry season?

5. In what ways does micro-livestock contribute to increased or decreased food availability within your home?

6. What expenses do you associate with having small stock?

7. Who, in your household, manages the money for purchasing feed, pens etc.

8. Who receives the money generated from livestock products/services?
   a. Have you prepared a budget for anticipating the expenses associated with keeping your livestock?
      i. Do you think keeping a budget has benefits?
   b. Do you have a bank account?

9. How has having small stock impacted your visits to your market?

10. Where do you learn about how to care for your micro-livestock?
    a. How does taking care of children (or being a mother) contribute to your ability to care for micro-livestock?

11. What steps do you take to help your micro-livestock breed?

12. How does having micro-livestock increase or impede your access to services such as veterinary care, extension services and APERL staff?

13. What relationships within your community, or outside of your community, are most important for receiving benefits from and caring for your micro-livestock?
    a. Do people come to you to seek advice on how to care for micro-livestock?

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14. What types of training and education have you had access to in order to care for your micro-livestock?
   a. Prior to receiving access to education and/or training for micro-livestock rearing, what other types of education have you had (i.e. level of education)?

15. Will having training in micro-livestock rearing help you find employment opportunities in the future?
   a. Can you give an example of the type of work you may be able to get?

16. What is your opinion of the inclusion of women into the livestock rearing opportunities presented by APERL?
## APPENDIX FOUR

MARKET SURVEY FOR AVERAGE COST OF MICRO-LIVESTOCK TYPES IN SUNYANI DISTRICT, BRONG-AHAFO REGION, GHANA, AUGUST 2011

<table>
<thead>
<tr>
<th>Animal Type</th>
<th>Community</th>
<th>Young (at Birth)</th>
<th>Breeding Female</th>
<th>Adult (eating stock)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goat*</td>
<td>Sunyani Market</td>
<td>20GC</td>
<td>60GC</td>
<td>100GC</td>
</tr>
<tr>
<td></td>
<td>Fiapre Town</td>
<td>20GC</td>
<td>70GC</td>
<td>80GC</td>
</tr>
<tr>
<td></td>
<td>Dumasua Town</td>
<td>10GC</td>
<td>70GC</td>
<td>80GC</td>
</tr>
<tr>
<td></td>
<td>Ayakomaso Town</td>
<td>10GC</td>
<td>70GC</td>
<td>80GC</td>
</tr>
<tr>
<td>Sheep**</td>
<td>Sunyani Market</td>
<td>15GC</td>
<td>70GC</td>
<td>80GC</td>
</tr>
<tr>
<td></td>
<td>Fiapre Town</td>
<td>10GC</td>
<td>60GC</td>
<td>70GC</td>
</tr>
<tr>
<td></td>
<td>Dumasua Town</td>
<td>15GC</td>
<td>60GC</td>
<td>65GC</td>
</tr>
<tr>
<td></td>
<td>Ayakomaso Town</td>
<td>10GC</td>
<td>60GC</td>
<td>80GC</td>
</tr>
<tr>
<td>Pig***</td>
<td>Sunyani Market</td>
<td>30GC</td>
<td>200GC</td>
<td>700GC</td>
</tr>
<tr>
<td></td>
<td>Fiapre Town</td>
<td>25GC</td>
<td>100GC</td>
<td>400GC</td>
</tr>
<tr>
<td></td>
<td>Dumasua Town</td>
<td>25GC</td>
<td>100GC</td>
<td>300GC</td>
</tr>
<tr>
<td></td>
<td>Ayakomaso Town</td>
<td>30GC</td>
<td>150GC</td>
<td>450GC</td>
</tr>
<tr>
<td>Grasscutter****</td>
<td>Sunyani Market</td>
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<td>30GC</td>
<td>60GC</td>
</tr>
<tr>
<td></td>
<td>Fiapre Town</td>
<td>20GC</td>
<td>25GC</td>
<td>50GC</td>
</tr>
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<td>40GC</td>
</tr>
<tr>
<td></td>
<td>Ayakomaso Town</td>
<td>15GC</td>
<td>25GC</td>
<td>50GC</td>
</tr>
</tbody>
</table>

*Average weights of goats: 1.5kg at birth; 12kg breeding stock (female); 25kg eating stock (adult male)

**Average weights of sheep: 3kg at birth; 35kg breeding stock (female); 40kg eating stock (adult male)

*** Average weights of pigs: 5.5kg at birth; 125kg breeding stock (female); 134kg eating stock (adult male)

****Average weights of grasscutter: 1.5kg at birth; 3kg breeding stock (female); 4.5kg eating stock (adult male)