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The gendered nature of productive and reproductive roles in the agricultural sector

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Abstract

The aim of the study was to examine the roles of both male and female farmers in the agricultural sector and how the interact to perform these role. The fieldwork researched two communities in two districts of northern region, Ghana. Data was also collected from agricultural development agencies: Savanna Agricultural Research Institute (SARI), the Ministry of Food and Agriculture (MOFA) and World Vision Ghana (WVG). Data collection was achieved through formal surveys, Focus Group Discussions (FGDs) and observations. A total of 100 participants were interviewed guided by semi-structured questionnaire. Forty-five set of questionnaire- 15 each- were administered to the three Agricultural Development Agencies. While 150 community members made up of both female and male farmers took part in five Focal Group Workshops. Results show that the contribution of rural women in agriculture is unpaid for because they work on family farm lands and do not control farm produce. Women contribute up to a total of 56 hours a week on farm and domestic labour with minimal sharing of tasks from their spouses and sons in the household. In spite of the acknowledgement of women's economic contributions by agricultural development agencies, women usually do not have direct access to valuable innovation. In conclusion, culture, social and economic factors have a major role to play in the productive and reproductive roles of both men and women in the agricultural sector.

Keywords: Gender; Northern Ghana; Innovation; Farmers; Cowpea Production

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1. The gendered nature of productive and reproductive roles in Northern Ghana

Agriculture is an important aspect of development and women in developing countries are usually the major sources of labour despite their already crowded domestic tasks. However, their contribution to the agricultural and domestic sectors is and remains unpaid. Empirical studies on gender roles by Boserup, Okali, Whitehead, Quisumbing, and Jackson have contributed much to the understanding of gender roles in the agricultural sector and the household. However, much has not been studies in the Northern Region of Ghana. Though gender roles across Africa and parts of the World are similar, there are differences arising in the productive and reproductive roles of men and women in various locations due to cultural, ethnic, social and economic differences. For this reason, it was necessary to conduct this research considering the fact that the Northern Region of Ghana is the food basket of Ghana and a major producer of cereal in Ghana. This research will add to the understanding of research in the agricultural sector in Ghana and elsewhere; highlighting the significant contribution from Northern Ghana.

Women were hitherto excluded from rural development programs but since Boserup raised concerns in the 1970's women have gradually been included in rural development programs at various levels. There has therefore been considerable and remarkable research and data collection on the immense contribution of women all over the world especially Sub-Saharan Africa. The existence of the MDGs and now the SDGs has made it even more prominent to consider gender issues in rural development programs. Research has shown that women contribute proportionately more labour than men particularly in farming communities when domestic work is considered, thus making it all important to actively involve men and women in rural development programs (Doss, 2011).

Earlier research in Ghana has looked at women performing over-burdened and subordinate roles to men. In recent times, however, gender roles between men and women in the agricultural sector and household inter lap and have become more complimentary. It therefore calls on national government and international bodies and donors focus more on these roles to re-strategize and shape policies in the agricultural sector that would reflect practically, current gender roles to enhance productivity in the agricultural sector and household.

It is necessary to consider gender in development programs and for that matter perilous not to consider gender issues. At the moment, most technologies, except some of those that are meant for processing, do not necessarily target women in the agricultural sector whereas women undertake almost all farm activities (Blackden and Wodon, 2006). To understand and appreciate the gendered nature of productive and reproductive roles in the agricultural sector in recent times, it would be necessary to know the extent to which earlier concerns and studies have changed productive and reproductive roles of men and women and rural development programs. To analyse these roles and how much they have evolved over time, data was gathered on the productive and reproductive roles of women and men and innovation transfer and the role of Agricultural development Agencies. Data gathered also included women's key roles in innovation transfer and how women are progressively gaining independence in terms of their productive and reproductive roles. The study also gathered data on how men and women participated in a Farmer Field School of cowpea Integrated Pest Management.

There is not much literature on the role of women in the agricultural sector in Northern Ghana. To understand the role of women in the agricultural sector better, it is important to look at both the productive and reproductive roles of women vis-à-vis men. Research on the Gendered Nature of Productive and Reproductive Roles in the Agricultural Sector was undertaken in the Northern Region of Ghana to have a better understanding of the gendered roles, to add to and to strengthen already existing literature on Gender roles in the agricultural sector. It was also to understand how men and women interact to achieve/met these roles because men and women have varied productive and reproductive roles though these roles are in recent times overlapping due to technological advancement. Gender roles have gone through a series of metamorphosis due to passage of time, education and technological advancement.

2. Literature review

One of the focal points of this literature is to expatiate on earlier research that demonstrate that women have been and continue to be over burdened with roles in the household and the agricultural sector though they are important partners in both sectors.

2.1. Women and agriculture

The work of Boserup contributes much to the past and current understanding of women's position in the developing world, their contribution to agriculture and the inequalities that women continue to experience. Since Boserup raised concerns about women being excluded from or even losing out from rural development programs in the 1970s, women have become the focus of considerable research and data collection, and are the target of many development interventions (Okali, 2002). All over Sub-Saharan Africa, the existence of the MDGs has made it possible for the inter-relationship between agricultural and domestic activities to be explored (Audinet and Haralambous, 2005). Women carry the double burden of unpaid work in the home (providing water and firewood, caring for the sick) and the fields; and cannot compete or even cooperate with men on equal terms (Boserup, 1970, Food and Agricultural Organization [FAO], 1994, Herrera and Torelli, 2013). Women also provide most of the labour for post-harvest activities, taking responsibility for storage, handling, stocking, processing and marketing. This is one of the major ways that distinguishes them from their male counterparts (Jackson, 2007). According to Herrera and Torelli (2013) domestic work to produce services consumed by the household is not considered as work in the official labour force indicators. For that matter, an individual in full-time domestic work is therefore considered 'inactive'.

In Britain, traditional gender roles such as women being responsible for caring for children when they are young and men being the breadwinners are changing over the past decades. Many women now take on paid jobs, especially part time jobs or job shares when their children are young or of school going age. Laudably, men are gradually sharing in domestic responsibilities with women; a move away from their traditional male roles. However women in 2002 to 2012 still consider that they do more than their fair share of household work. This is because men's uptake of unpaid domestic work is not encouraging (Scott and Clery, 2013).

Various definitions of paid and unpaid jobs have been proposed but the difference between two remains blurred. Unpaid labour includes subsistence production, reproductive work and volunteer work. Reproductive work covers domestic and care work. Domestic work includes preparing meals, laundry, cleaning, household maintenance and personal care. This misconception throws light on conceptions of paid and unpaid work (Blaskden and Wodon, 2006). For this reason women are affected both as producers and reproducers; and as carers for their children, the sick and the elderly (Longwe, 1991; Jackson, 2007).

Whitehead argues that there is value in labelling some farming systems as 'female', because of the emphasis given the contribution of women's work to farming, in contrast to the general views that agricultural field work is primarily a male province. This does not imply an absence of male/female farming which is often critically important. For example, in land clearing, several studies report that women purchase labour for these activities in their husband's absence (Whitehead, 1996). There is evidence from Ghana, parts of Malawi, Tanzania and Nigeria, which indicates that women tend to contribute more labour than men in farming communities, especially when domestic work is taken into account (Agarwal, 1985; Doss, 2011; Grassi et al., 2015). For example, a study relating to Ghana gives a figure for work time in farming households of 35.39 hours per week for men and 46.97 hours for women (Agarwal, 1985; Doss, 2011). In a Tanzanian study, men are noted to have worked an average of 1829 hours per year and women 3069 hours (Agarwal, 1985). This has also been reported in Zimbabwe, Nigeria and Uganda. Where men are calculated to work more hours than women, it is often noted that women's domestic work is often ignored (Agarwal 1985; Herrera and Torelli, 2013). Generally the division of responsibilities is not the same for men and women, with women performing almost all domestic tasks and men focusing in activities that bring in income (Blaskden and Wodon, 2006).

However, a good number of empirical studies (Boserup 1970:53, Inaizumi et al., 1997, Udry 1996 and Quisumbing 2003) suggest that if the resources available to or controlled by women are increased, there is much potential for increasing their agricultural productivity (Food and Agricultural Organization [FAO], 2011; Udry, 1996; Quisumbing, 2003). Thus education and access to technological resources can reduce the constraints women face and increase agricultural productivity, which translates into food security both at the rural household and urban household levels (Meinzen-Dick et al., 2010). In recent times much of the official neglect of women farmers has been attributed to the often mistaken assumption that any kind of benefit or information that reaches the household head will be passed on to other members of the household (Food and Agricultural Organization Garcia et al. (2006) downplaying the role of women in farming (Safilios-Rothchild 1994). However, women's participation does not necessarily represent their empowerment (James 1995; Sampson and Morrison, 2006; Lopez, 1991) as they continue to be directed by their 'husbands' or 'men' more generally. This may be due to norms and values. For instance, a man may ask his wife not to be part of a development program, so when the program begins and she does not opt to be part of it, no one is able to tell why (Doss and McDonald, 1999).

Turning specifically to research on northern Ghana, Whitehead's focus on gender relations in agriculture reveals an important aspect in development planning which had previously been overlooked (Whitehead, 1981). Her attention was on the varied ways that both men and women are involved in agricultural production. She highlights the danger in making unsubstantiated assumptions about what constitutes a

household, how resources are distributed between household members, and the interactions between them. Prior to this, the household was thought to be a production unit headed by a male. As previously argued, this assumption had a negative impact on the distribution and transfer of agricultural services since these were mainly targeted at the household head, which neglected the women who were the ones mainly involved in agricultural production (Whitehead, 1981). Whitehead transformed this understanding and turned the much held conventional thinking upside down; she showed the household to be a place of subordination and control of gender hierarchies and conflict, that broadened the understanding of agricultural extension staff and research of the need to channel resources sent to farming communities not only to the household head but also specifically to the women involved in agricultural production (Naylor, 1999:40; Whitehead, 1981; Whitehead, 1996). Nevertheless, whatever social norms dictate, the reality is often that, women's roles in agriculture are important because they have implications for agricultural productivity, food security, nutritional status of household members, employment and poverty reduction (Mienzen-Dick et al., 2010), which includes resource allocation.

2.2. Women and innovation

Agriculture is a major source of rural employment for both men and women in sub-Saharan African, South Asia and Southeast Asia. In sub-Saharan Africa and Eastern Asia, about 50 per cent of women engaged in agriculture (Grassi, Landberg and Huyer, 2015). However, the assignment of roles in the agricultural sector often follows a traditional pattern with specific roles assigned to men and women. The assignment of these roles is continuously shaped and negotiated with women carrying a burden of doing both domestic and agricultural roles (Grassi, Landberg and Huyer, 2015). Women's tasks' therefore revolves around domestic and productive work thus technological advancement is important in reducing and improving women's work load (Food and Agricultural Organization, [FAO], 2001). This is because, the number of women doing agriculture to feed their families is households, communities, countries and regions is increasing (Food and Agricultural Organization [FAO], 2001).

Some women may accept the assumption of modernization theorists in enhancing the wellbeing of women. For example, Walt Rostow cited in Shehu (1997) formally asserts that improvements in the individual's overall socioeconomic status are related to education, skill training, access to modern amenities and innovations, and an improved financial situation. In addition, technological change is to ease women's toil and the burdens associated with their status and welfare. However, changes in women's roles within any cultural system remain unchanged, with men controlling modern amenities or new innovations (Shehu 1997). Although Shehu has argued that changes in women's roles within any cultural system cannot occur due to male superiority, it is important to note that gender roles can change in any context. For instance, in the agricultural sector, gender roles are gradually changing as the sector is becoming technologically sophisticated and commercially oriented with changing migration patterns and climatic viability in the rural landscape, where agriculture is present, in the developing world (Food and Agricultural Organization [FAO], 2011).

Varying amounts of work have been done on developing and improving innovations related to crop production and processing in which women are heavily involved (Carr, 1985; Grassi et al., 2015). The majority of rural women, however, are completely unaware of the existence of most of the improved innovations that can help them (Grassi et al., 2015). When information does filter down at the village level, it is usually the men who receive it because extension workers are men, or because it is only the men who have time to sit around at organized meetings where such information is given out (Agarwal 1985; Carr 1985).

Little can be said about a theoretical framework that might be useful for examining rural women and technological change (Whitehead, 1994). However, the most important forms of technological change affecting women are not innovations targeted directly at them, but rather they are the indirect consequences of planned or unplanned innovations in rural agricultural production systems as a whole (Food and Agricultural Organization [FAO], 2001). Unplanned innovations occur when problems suddenly rise and needs sudden solutions whereas planned innovations are planned from the onset and every step followed as planned to achieve the desired result. However, planned and unplanned innovations can be incorporated in to one innovation plan (O'Sullivan and Dooley, 2009). Findings suggest that the most significant forms of technological change affecting women may not be aimed directly at them (Peterman, Behran and Quisumbing, 2010; Abdelali-Martini and Dey de Pryck, 2014; Grassi et al., 2015). Whitehead argues that constantly functioning and extensive dissemination of unplanned technological innovations often come with modernization in agriculture as well as widespread changes in the socio-economic system (Whitehead, 1994).

In the past and even today there has been an assumption that women are risk averse (Jackson, 2007); as a consequence they are seen as less innovative and enterprising than men, since both innovation and enterprise require a degree of risk taking. However, this is contradicted by Seur's study of enterprising women farmers in several districts of Zambia, where findings indicated that the production of hybrid corn and runner beans had increased by 19 percent after a group of women adopted a new innovation on their cultivation despite their lack of resources ownership (Jackson, 2007:111)**.** Women can also prevail in areas where no innovation has been introduced, although they are the first to be displaced from tasks that can be commercialized and or mechanized (Carr, 1985). Jackson argued that women continue to take risks, innovate and adopt new innovations. However, Jackson also comments that where women farmers emerge successful, they often have difficulties sustaining marriages and end up being single/female-headed households as they were seen as having over-looked their spouses (Jackson, 2007).

Many of the improved innovations already developed for women in rural Ghana are in the area of food processing as described by Date-Bah (1985). For example, improved sun drying racks for drying fish and cassava chips were introduced to reduce the time used for drying fish and cassava chips from six weeks to only a few days. Another innovation, a mechanized cassava grater, made it possible to reduce the time spent processing cassava into granules. Also a processing machine has been introduced to squeeze out water from the grated cassava within few minutes instead of over several days. At the same time, a large enamel roasting pan that can take almost ten times the quantity as the traditional pan was introduced. It is intuitively obvious that in each of these examples time used in processing has been reduced, which can increase the productivity of women both at the household and farm levels. Before the use of the innovative cassava techniques, 500 bags of cassava granules, weighing 50kg each, a week, was produced in Mafi-Kumasi each week. With the

introduction of the innovation the women began producing 5,000-6,000 bags a week. This increased output could only be maintained with an increased yield and so a male cassava growers association was formed and of course they produced with help from women (Date-Bah, 1985), an indication that both men and women need to work hand in hand for their own development. In the case of Nigeria, only men could afford to buy mechanical cassava graters and so women sent their cassava to them to grate for a fee (Adekanye, 1985). This indicates that at the time women in Ghana were either able to save to buy such equipment or were granted loans by credit services that operate in and around the country.

Despite tremendous successes in introducing new innovations such as these, there have been others that have not been adopted due to the inability to figure out the actual needs of the women, unsupportive norms and values and also the lack of involvement of women at the design stage. In the Binaba agricultural station in the Upper East Region of Ghana, an attempt was made to introduce farmers to bullock ploughs and dry season gardening. The women farmers, however, could not participate in the bullock plough program as local customs and taboos forbade them from touching cattle. This shows that although the cost and complexity of the improved innovation sometimes act as constraints to adoption, social factors also count.

In spite of high technical efficiency, sometimes an improved innovation is still rejected on the grounds of social factors (Date-Bah, 1985). Early involvement in the identification and development of an improved innovation contributes more readily to its acceptance. This is likely to lead to the fashioning of the improved innovation in a way that agrees with women's accustomed modes of doing things and their values in an area they perceive to be of prior concern to them (Date-Bah, 1985). According to Stevens (1985) innovations have been known to conflict with existing social norms and beliefs.

Improved innovations that have been adopted by rural women in Ghana have almost all been developed by local research and development institutions. These are also those innovations that involve the upgrading of local techniques (Date-Bah, 1985) pointing to the fact that considering the norms, values, traditions and the needs of local people during innovation development is essential.

According to Amoako-Nuama (1996) Ghanaian women, like other African women, have the role of being primary resource managers, especially in rural communities. They are accountable for the economic and nurturing activities as subsistence farmers producing about 70 per cent of the national food crop output (Amoako-Nuama, 1996). Aside their contribution to agricultural productivity, they also have roles to play as household managers and educators. However, some disapproving cultural practices render them as second to men (Amoako-Nuama, 1996). Women are the major contributors to agricultural productivity; household managers and educators so it will be imperative to consider the role women play in innovation diffusion and adoption (Doss, 2011; Boserup, 1970). As mothers, women can act as educators where innovation transfer is concerned because traditionally they are responsible for educating and training younger children. As educators, they educate mostly their children and peers so it will be vital to document how they transfer innovations through the medium of education; the circulation of information.

Women and innovation transfer is an imperative of agricultural innovation, because a majority of rural women are involved in agricultural production, and depends very much on capacities and approaches within the national agricultural research systems of developing countries (Poats, 1991). Continued effort is

therefore needed to build these capacities, and to increase women's participation in the area of agricultural innovation. This is because women's role in agricultural production is essential in determining their involvement and the role they play in technological advancement (Saito and Weidemann, 1990; Eriksen 1995; Barot, Bradley and Fenton, 1999).

3. Method

3.1. Methodology, sampling procedure and data collection

The following methodology aims to collect data to determine how gender concerns raised in the 1970's has altered gender roles in recent times thereby documenting the gendered nature of productive and reproductive roles in the agricultural sector.

The northern region is one of the ten regions of Ghana and is divided into 13 districts. From the 13 districts 2 were randomly selected for this study. One community each were selected from each of the randomly selected districts for the study. These communities were Tamalbila, located in the Tolon Kumbungu district and Kpasa located in the West-Mampusi district. Predominately agriculturally based, the study area relied on farming for food and income.

Three agricultural development agencies: Savanna Agricultural Research Institute (SARI), the Ministry of Food and Agriculture (MOFA) and World Vision Ghana (WVG) were also researched. Thirty individual questionnaire- 15 each- were administered to the three Agricultural Development Agencies. The actual names of the communities involved were changed to Tamalbila and Kpasa; these are pseudonyms.

Seven household were observed in the study communities; three in Tamalbila and four at Kpasa. Households were numbered and randomly selected using an online random choice generator. Observations were structured to capture major points of interest such as the agricultural and non-agricultural roles played by all household members. A total of 100 individual interviews were conducted for the formal survey guided by the questionnaire while 150 community members, made up of male and female farmers were involved in five Focal Group Discussion (FGDs) Workshops. The individual interviews were mostly for household heads but the female respondents were either household heads or representatives of household head. Three FGD workshops were held in Tamalbila and two FGD workshops in Kpasa. Data obtained by the questionnaire and FGDs were analysed by NVIVO.

4. Results

4.1. Productive and reproductive roles and gender

Farmers themselves and their family provide labour for farm and post-harvest activities than depending on hired labour. Such activities include weeding, planting, sowing, fertilizer application, harvesting, storage,

handling, stocking, processing and marketing in the family or household. Women's fundamental contributions to household and food production systems are acknowledged by men and women and the agricultural development agencies. The study showed that women play a significant part in the agricultural life of their communities and these efforts do not only benefited women and their children, but also men were significant beneficiaries. Women are good at whatever they do, because of their ability to multi-task and pay microscopic details in every assignment they undertake. They strive to look after kids, perform their domestic duties which benefit the entire households and work on farms lands. If a man cannot provide basic necessities for his family, wives do. Women are the lifeline in most households because they are increasingly becoming the main bread winners. Unfortunately despite this perceptible increase in reconciling and appreciating the value of women in contributing to the productive and reproductive needs of the household, the support most men give to their wives is lamentable.

In many agricultural societies young men work on farms long before they marry. In the individual interviews and FGDs, women in Kpasa and Tamalbila were married by the age of 18, into polygamous marriages. The women explained that once married, they become a source of labour on their husband's family land. Before marriage, women had rarely been active participants on their family's farms. Women are an important source of labour and are significant in production and social reproduction. This pivotal role makes their involvement so important.

The contribution of rural women in agriculture is unpaid for. This is because women work on family land but do not control the farm produce. The husbands or family heads usually determine how income generated from the farm produce is to be utilized. In the two study communities, (through FGDs, individual interviews and observations), women contribute significant labour to the household's agricultural production and spend up to 56 hours a week on farm and domestic labour, with minimal sharing of tasks by spouses or sons in the household: who contribute on average 42 hours per week. Estimates indicate that on average, women work in agriculture for 10-14 hours a week more than men during the rainy season and for 15-20 hours a week more than men during the dry season. With Kpasa, women have taken advantage of new opportunities to produce vegetables for urban markets. The women explained that land for vegetable farming is family owned or rented land. Vegetable seeds are dried and stored from the earlier year's harvest but also could be purchased at any of the surrounding markets in the district. World Vision Ghana trains women vegetable farmers. This includes irrigating the vegetable plots during the dry season with water from a communal dam about three kilometres from the village. Women in Kpasa estimated they together with the children they contribute 70 percent of total time and labour needed to grow, harvest and market vegetables and men contribute the remaining 30 percent. The women undertake the bulk of the required agricultural labour.

Access to land is important in agriculture productivity as the main income for the upkeep of a rural household comes from agriculture. It was indicated by women in Kpasa in the FGDs that a few women and men have access to land separate from the family land and so work on their own besides the family land. They combine labour on the family farm with independent production to further meet the needs of their families. This independent income is vital for the survival of the family. This is because the structure of sharing financial responsibilities within the household rests on both men and women.

Women and men in the study belong to one of the local groups that play an important role in helping get resources to improve on productive and reproductive roles. It is important to note that individual interviews showed that groups enabled farmers' pool resources to reduce workload and improve on productive and reproductive roles. Observations and FGDs from the two main study areas show that these groups are male or female only groups and are formed to offer help to group members. For example, FGDs showed that farmers who are over-burdened with work on their farms, such as weeding and harvesting, ask other group members to lend a hand. Furthermore the pulling together of labour from group members enhances effective dissemination of new ideas in speedy completion of farm work. For their efforts, interviews with WVG staff show that WVG make resources available to women's groups. These resources helps to ease constraints women face at the farm and household levels, such as financial and agricultural input as reported in the two main study areas. These may include small loans, training on food preservation, basic education and simple processing equipment. WVG also supports men only groups by providing agricultural inputs such as seed, fertilizers, chemicals and harvesters, which is paid back in cash or with some farm produce after harvest.

Among the majority of rural dwellers, women perform all the domestic tasks, while many also farm and trade as in Table 1. All women interviewed are involved in agricultural activities and food production with their labour inputs often exceeding those of men taking into account farm and post-harvest activities (see Table 1). Estimations from individual interviews, showed women from Tamalbila and Kpasa handle 75 percent of food production, 70 percent of domestic food storage, 100 percent of food processing, 20 percent of animal husbandry and 70 percent of agricultural marketing. This earns them a better livelihood. Though men are into farm activities, they are most involved in taking decisions on farm and household, selling bulk produce from the farm and looking after livestock (see Table 1).

The communities' studied-individual interviews- have gender specific roles in agricultural production. Land clearing is assigned to men, while women and men take part in tilling the land and planting. Men and women do the weeding together, but women undertake additional responsibility of transporting crops from the farm to the home. Knowledge of the distribution of responsibilities can further inform development project planning and implementation. When a project is designed and an innovation developed, the structure of the various responsibilities in the family makes it easy to identify the target users. From individual interviews, I estimated women in Kpasa produce up to 80 percent of all staple foods but own less than 10% percent of land, whereas women in Tamalbila contributes up to 60 percent and own 2 percent of land. This is a sign women in Kpasa have greater access to land and resources than women from Tamalbila, where they own only about 0.5acres of cultivable land. This can guide the transfer of innovation where land is needed for women's use during the process of innovation transfer. Women in Kpasa contribute up to a third of labour in ploughing and half of labour in planting. They further contribute more than half of labour in weeding, 95 percent (children make five percent contribution) of labour in processing and preserving food, while performing up to 90 percent of domestic chores.

Seventy percent of the women interviewed at Kpasa showed female farmers are a major source of labour and can sometimes decide regarding farm management together with their husbands. They remarked this will not be possible 15 years earlier, but due to enlightenment, modernization and the realization by men of women's contribution to agriculture. During the individual interviews and FGDs it was agreed that men in

recent years have more flexible relationships with women as far as decision-making and management within the family farm; which is important in innovation dissemination and adoption. Throughout the study area, women's labour input is estimated- through the individual interviews-to be three times that of men.

Table 1. A Typical View of Men and Women's Daily Task's

Time of the day	Activity carried out during the day by men	Activity carried out during the day by women
6:00 - 7:00 am	Set off for the farm if farming season. If not instruct children to tend livestock	Undertake household chores
7:00 am	Undertake farm/post-harvest activities/chat	Undertake household chores
7:00 - 8:00 am	Undertake farm/postharvest activities/chat	Women and grown up girls prepare breakfast for the family. They take the breakfast to the farm, two to five kilometers away, for household members if farming season
8:00 am	Undertake farm/post-harvest Activities/conversation	Women join other household members on the farm or do post-harvest activities at home or extract Oil from Shea butter and groundnuts for sale or home use. Post-harvest activities include harvesting, handling, storage, processing, packaging transportation and marketing of farm produce
1:00 pm	Undertake farm/post-harvest Activities/chat	On the farm/market to sell farm produce/ undertake Post-harvest activities/processing of farm produce
2:00 pm	On the farm/chat /undertake Post-harvest activities at the marker to sell farm produce	Undertake household chores and then return to the farm after cooking lunch to continue with farm activities like weeding, planting, fertilizer application and harvesting/ undertake post-harvest activities/at the market to sell farm produce
4:00 – 6:00 pm	Return from farm/market	Return from farm/market/undertake household chores
8:00 – 9:00 pm	Conversation	Women continue their daily activities with Post-harvest or processing activities (these include processing shea nut, groundnut or parkia seed)

Source: field diary

Migrant labour, a feature of the Northern Region, has increased over the years. This reflects the differences in economic opportunities in the north and south of Ghana. FGDs and individual interviews showed that migration from the north to the south is often seasonal and in the dry seasons, so not all men and women who migrate stay away during the rainy/farming season. As a result, women are forced to manage all agricultural activities alone as most of the able-bodied men in their families migrate to the south in search of work. Women from the study area complained during the FGDs, their problems are not with

managing the farms in the absence of the men, but with the new agricultural techniques they use. With Tamalbila, the tractor and hand-held tools often used in land preparation meant fewer problems than in Kpasa, where oxen or donkey-driven ploughs are used. Inadequate animal power can therefore be a problem in advancing technological development in Kpasa. Because of the traditions of Kpasa, women may not drive oxen or donkeys, which are the preserve of men. It was revealed through the FGDs that to use oxen to plough in Kpasa, in the absence of husbands working elsewhere, women wait to request the services from men who finished with ploughing their own lands. In the process such women lose the benefit of the early rains, which affect their crops and the resultant yield. If such women are unfortunate to get sufficient subsistence from remittances of household members who migrated, they may suffer consequences of being unable to provide for their family. Where they are cultivating improved cowpea, such women are unable to plant in time, which affects their agricultural output and their ability to practice agricultural innovations. Thus women whose husbands are absent working elsewhere suffered considerable disadvantage when they cannot, or do not, send sufficient remittances back home.

The care of children, paying of school fees, clothes, health care and contribution to feeding, of children remains predominantly women's role. FGDs and individual interviews showed that in Tamalbila and Kpasa, the care of infants is seen as a collective responsibility, but traditionally women discharge these duties most of the time graciously and effectively. Seventy percent of the men interviewed in the study area indicated that men who take part in childcare do it because they love to do it, rather than as part of their duties; out of respect and show of love for their wives, or because they are 'modernized'. Men are changing their role in family life and some are now willing to help their wives in domestic activities. Meaning women will have more time for their domestic and farm roles enabling them to improve on production and productivity. The major drivers for these changes in attitude of men are social and -economic changes within villages. Where there is a lack of support from men, women reported through FGDs it was difficult for them to make meaningful contributions to farming and household sustenance.

Male attitudes towards gender roles seemed complicated in the study area. The individual interviews showed that not only were there differences in attitude among male and female household members, but also these differences vary in age, marital status, education and experience within households, between households and within communities. These impacts on innovation adoption; such variations in attitude are dependent on whether the farmers are exposed to new ideas within or from other community. Individual interviews from the study showed that whereas some men seemed to change their attitude towards traditional roles others stuck to them. These attitudes range from their social relationship with women to children and new innovations. Observations, individual interviews and FGDs showed some men gave their wives the opportunity to make independent decisions and also help with childcare, while others insist on the status quo that these are female responsibilities. Some men are inconsiderate and inflexible when it comes to changing or amending the social structures bequeath. Abudu, explained that, women are like leapers; if you allow a leaper a hand shake he will soon be asking for an embrace. He further explained that if you help a woman in her domestic chores she will soon ask you to carry her good to the market.

Women at the FGDs described how they are now taking up roles assigned to men, in households where male members are migrating. Dawuni, a-47-year-old male household head from Tamalbila reported that

male migration from rural areas originally led to a rise in female participation in agriculture. Later, when women migrated in large numbers to the urban areas, the percentage of female workers in agriculture decreased. There was a negative impact on agriculture activities as a result of migration. Dawuni further stated that migration is however, seasonal and did not affect many of the agricultural activities in the farming areas.

Both men and women play productive roles in furtherance of the cultural, social and economic wellbeing of their households and communities. Women are burdened with a greater share of the roles observed in the study areas. Women's productive and reproductive roles are still affected by socio-cultural norms; such a situation sheds light in our understanding of the lives of rural farmers and the drudgery confronting them.

4.2. Women, innovation transfer and the role of agricultural development agencies

Since the early 1990's, the three agricultural development agencies have been advocating the importance of changing or modernizing gender related issues within their mandate areas. The WVG in Tamale started its operations in the northern region in 1979, MOFA and SARI begun in the 1960s and the three have since worked with women farmers. In this section, I examine the purposive role of these agencies in transferring innovations to farmers with particular emphasis on women. Interviews with the MOFA, WVG and SARI show that there is a significant impact as shown by improved participation of women in the processes of innovation development, transfer and adoption. The agencies see the need to build a competitive and elite work force. As a consequence the drudgery experienced by working women in the agricultural sector has decreased and women's use of improved farming systems and strategies has increased. For cowpea production, interviews from SARI and MOFA showed that women benefited from available improved production and seed and grain storage innovations, alongside men. Women are no longer ignored but are rather viewed as 'important' targets in diffusion programs as they together with men undertake almost all farm and post farm activities.

From the fieldwork it emerged innovation has remained a viable vital tool for improving the productivity of the agricultural sector in the study villages. Interviews from SARI indicated that a major step in improving food production has been the increase in the number of agricultural innovations developed and transferred to farmers. Lessons learnt from the achievement in increasing in agriculture productivity is, the three agricultural development agencies realized not only men but women are key to agricultural productivity and should be considered in innovation transfer. Luke, a program officer from WVG, was keen to point out that most women farmers are now involved in innovation diffusion programs. Again, Abebe, a male program officer for MOFA, said the main idea is the element of gender in their activities, emphasizing the importance of a gender unit in MOFA. Activities of the three agencies show the role of both men and women in agriculture is now recognized as being important, and focused on both female and male farmers. Women are now recognized to possess tremendous intellectual infrastructure to contribute meaningfully to agriculture.

The significant role of women in the agricultural sector is acknowledged. Interviews with staff from the three organizations view women farmers as key resources, and commented women are engaged in a wide range of agricultural activities, and are regarded as 'fast adopters'. Staff from MOFA and WVG expressed the

view that women farmers can easily assimilate and disseminate innovations to others in the villages where they live and to other villages. Zak, a program officer from WVG, reiterated women are quick to notice which innovations work and which do not, and so are quick to adopt such innovations if they can access them.

To ensure and enhance women's participation, all the three agricultural development agencies involved in the study showed they make sure a percentage of farmers trained are women. The agencies have come to appreciate that as a human society, there is the need to abandon retrogressive and outmoded practices and adopt or embrace progressive ideas. Alhassan, a program officer from MOFA showed on average, four out of ten taking part in program are women, reflecting the strategy of gender main-streaming within the ministry. He also noted the success of an activity is measured by the number of women benefiting from innovations and in decision-making on innovations. He further laid down procedure for involving women in MOFA's programs. Similar procedures are reported by informants from WVG and SARI. This was shown during interviews with Moses a program officer from WVG. Carl, programs officer from SARI, attributed this concern with women farmers to women farmers being marginalized in decision-making and not regarded as being as important as male farmers.

Clear institutional guidelines and practices can make a difference in women's lives. With these conscious and coordinated efforts by the three agricultural development agencies and the request and appeal from women, it is much easier for the three agricultural development agencies to work with women.

The role of women's groups is enabling. From the study villages and the three Agricultural Development Agencies, it was shown that women leaders from well-organized groups, known as the "*Magazia*" play an active role in mobilizing group members when 'something new' is diffused to women. The "*Magazia*" selects some of the group members on the basis of their performance in previous programs, to learn and later transfer to the remaining group members who are interested.

As described by the Carl from SARI, Alhassan from MOFA and Zak from WVG, a "*Magazia*" is an older and respected woman who is chosen by the community to represent women. In many leadership positions, "*Magazia*" are sometimes not chosen but rather draw attention to themselves by exhibiting leadership traits and are recognized by community members as born to lead. The "*Magazia*" wield enormous power, are influential, respectful and patient with others and their opinion is considered important to the chiefs and elders of the community. They are a force to reckon with. They are the point of contact between the women as a group and the rest of the community. In many communities in northern Ghana there are "*Magazia's*" since they are in a better position to use coercive, persuasive and non-aggressive approach in roping women into new programs.

The customs and traditions of the villages under study are sensitive and, if not well handled, can bring about major obstacles to program implementation. Azam, explained that if the delicate and sensitive cultural issues are not addressed from the onset, introducing technology would be like drilling holes in a floating boat which inevitably will sink. In transferring agricultural innovations Dawuni, a programs officer from MOFA, showed the awareness of the customs of the people has to be paramount. An example he gave is tradition dictates men cannot sit by other men's wives, and most of the three agricultural development agency staff are men. This makes working with married women and women more difficult. He showed despite efforts of

governments and donor agencies to support increased agricultural production and productivity, there is continued concern on research and innovation transfer involving men and women. Dawuni, explained,

> *'…Women are required to sit at the back else they may not come near. When they come near any meetings involving development agencies, they are expected to keep their mouths shut and just listen. Where they may contribute, because it is a norm for women not to be heard in the presence of men, they are shy yet given the opportunity they can make brilliant contributions. Working with women is painful and frustrating but can be strategically rewarding. A lot of time and effort is needed to discuss and convince men in rural communities about the need to include women in development programs. When we succeed, the next time we go back to the community we go through the same process again.'* (Interview, Northern Ghana, September 20, 2010)

Cultural and social norms and economic status all determine the position of women in innovation transfer. Despite their cultural, social and economic position, women in the three study villages are involved in agricultural innovation dissemination programs organized or overseen by the three agricultural development agencies. As a result, they transfer innovations they adapted to their peers wherever it is convenient as detailed by Martha, a-36-year-old female farmer from Kpasa:

> *'While in the commercial vehicles (i.e. taxis and tro-tros) we discuss the new innovations we learnt, and discuss with those we sit together with to sell. Wherever we find ourselves together we discuss and transfer information on the innovation to our colleagues at a later date.'* (Interview, Northern Ghana, October 13, 2010)

This demonstrates that women are aware of the benefits of new innovations and will make efforts to adopt them and disseminate information to others.

However, according to Aminata, a-45-year-old female farmer from Tamalbila, in view of the social standing of some men, and the prevailing social and cultural practices that places the man above the woman, it will take quite an effort to get women more fully involved in innovation dissemination programs, although the status and influences of the "*Magazia*", and other senior women should not be undervalued. It was established by Alhassan from MOFA that attitudes towards women as inferior and lesser beings at all levels are reinforced directly or indirectly in many complex ways. For example, Amina, a-45-year-old female farmer from Tamalbila indicated that when women are grouped together with men in a program, they are relegated to the background. In such situations, Talata, a-30-year-old farmer from Tamalbila said that women do not want to talk unless prompted by the moderator of the program, thus underlining their more marginal status.

The learning on group composition and its significance for women was indicated by Davis, a programs officer from SARI in relation to the cowpea Integrated Pest Management (IPM) program. He noted that when the program was started 15years ago, women were not involved in the program. With time, however, they did become involved but were grouped with the men. As the program progressed it was noted that it would be better to have women only groups, and once this had been accomplished this revealed that many women performed better than many men. Many women became involved in all the activities that have to be

undertaken in the production of cowpea, from preparing the land for planting cowpea to storage and utilization, in the Farmer Field Schools (FFS). On the side of the respondents at the village level on women's participation in the FFS, five of the women involved in the main/ individual interviews from Kpasa indicated that the FFS plots managed by women yielded about a third more than that managed by men.

Due to the subordinate position of women and their role in agricultural production, the extension of improved innovations obviously needs to reach them. Dawuni from MOFA commented that there is the need to target not only men but also women in innovation diffusion programs. Dawuni, from MOFA, indicated that so much effort has been put in especially by the three agricultural development agencies to target women during innovation dissemination programs. However, he stated that it was at a snail's pace because there are many hurdles to cross. The most obstinate hurdle among them is making the chiefs and community members understand that women, just like men have the right to education, before women can become more fully involved in diffusion programs, especially in the rural communities. He further stated that generally women of the three study villages are required by custom to honour cultural, traditional and family values; especially respect for the chiefs, elders and men. There is a positive correlation between an individual's actions and the values and customs of her paternal family or the entire village. Women who are social or cultural deviants are isolated. This implies that the roles of men and women are divided or shared along traditional lines but men never let go their enviable roles as people in charge or managers of family resources.

In spite of the concerns expressed by the MOFA and WVG about the continued negative influence of customary norms and values on the behaviour of women and men, some women farmers have indeed excelled in their farming activities and serve as role models to other female farmers. One of these, Mary, a-39-year-old female farmer from Kpasa alluded to the influence of Madam Janet Nyasebase, a national best female farmer from northern Ghana. Mary indicated that Janet encouraged women to invest in farming not only for their subsistence, but also for sale. Mary observed that many women are capable of managing and making decisions on their own, and must not depend on their husbands or others to lead them. A majority of the women interviewed in Kpasa mentioned Janet as being instrumental to improving the cause of women.

Interestingly, there were also two male role models: one in each of the two main study villages. These two role models, Azabu, a-42-year old farmer from Kpasa, and Hudu, a-40-year-old farmer from Tamalbila, have won awards for being the best farmers in their districts. They indicated that they are the centre of admiration and attention of other farmers. They commented that everyone who wants to try out a new innovation would consult with them first. They also indicated that they are highly respected because their awards came with material benefits and their names were also mentioned with showers of praise on the regional radio station for their significant achievement. They also received certificates which they strategically and proudly display in their rooms for visitors to catch a glimpse of. As such, both award winners felt that many of the young men also strive to achieve a similar status. However, role models who are predominantly male farmers can be found in every community, unlike female role models who are rare. For instance Issah, a-25-year-old male farmer from Tamalbila indicated that in every district there are at least ten male role models who will be widely known across the district compared to only one female.

To ensure continued and quality transfer of cowpea innovations to both men and women, the staff of the three agricultural development agencies had been encouraged to work with and for men and women. As the information presented in this section demonstrates, women also ensure the success of their initiatives because they are designed to create equity. The women's role in the dissemination of information about an innovation is detailed in the following section.

4.3. Women: Key in innovation transfer

As already noted the majority of men from Kpasa, Tamalbila and all staff of the three Agricultural Development Agencies indicated that women in the study areas make key contributions to agriculture, are fast adopters and also transfer their knowledge to a wider community. They also argue that women have the capability to multi task so they can be involved in managing the household and farming activities, learning and transferring new ideas.

Women actively transfer innovation at the household and farm levels and to colleagues in their community and other communities. Within households, what women and men do is observed by others. In the case of women, each time they are observed using a new method of processing farm produce for example, they are transferring information. Most children from Tamalbila were observed practicing some of the IPM cowpea storage innovations haven observes their mother do it. Alima, a 13-year-old girl, from Tamalbila was observed dusting cowpea with ash in readiness for it to be stored. It is very easy for children to learn some practices from their parents especially mothers.

There are constraints on women's time but their regular involvement in speaking to their children and colleagues about new ideas make it important to involve them in diffusion programs. The study revealed the various opportunities that women have to communicate with others. Naata a-45-year-old female farmer from Tamalbila, indicated that women would usually speak to others about new agricultural innovations at planned social gatherings, such as funerals, naming and wedding ceremonies, and when they gather to prepare food for any social occasion. During these social gatherings, Naata indicated that people from other communities, both far and near, interact freely and in the process they share ideas as to planting, harvesting, storage, processing and marketing. She said they also meet on their way to and in the market, at the riverside when collecting water, in the farm gathering firewood and in vehicles travelling to and from the city. Adamu a 57-year-old female farmer, trader, widow, group leader and household head from Kpasa indicated that, 'women discuss and share ideas on new innovations on their way to the market and at the market.'

Market days are said to be very special. They take place every three days in Walewale for people in and around Kpasa, and every seven days in Tamale for people in and around Tamalbila. On these days women meet friends and relatives from surrounding communities and share ideas while undertaking their commercial activities. Martha had this to say: 'on our way to the market in the '*tro-tros*' (public transport) we discuss new innovations that we have learnt and heard of'. I had a first-hand experience of this form of innovation transfer because I took the same public transport as the women. During these journeys I noted how they often discussed with confidence the effectiveness and cost implications of these new practices, as well as comparing the new with existing innovations. For instance, in an observed discussion between two

women (one from Tamalbila and the other from a village close to Tamalbila) travelling on a '*tro-tro*', I recorded the following exchange on the preparation of "*winimix*" which is a locally made infant meal that is high in protein and made from ingredients like soybeans, groundnuts and fish:

Azara: Two weeks ago a nutritionist taught us how to make "*winimix*" for our children. I knew how to make it but what she taught us was different. It was a much easier method. "*winimix*" made using this method looked and tasted good.

Beata: What ingredients did you use?

Azara: We used soybeans, rice, fish and groundnuts. I think the inclusion of rice instead of maize and the mode of roasting them made the difference.

Beata: Do you know that some women use cowpea instead of soybeans?

Azara: No

Beata: It is good but I will have to come over to you and learn your method, teach you mine, before making a comparison. (Interview, Northern Ghana, November 31, 2010)

These women were not from the same community. This shows that discussions of farming and food preparation are not only among farmers from the same community, but with others who they meet often casually. They did not only discuss new innovations but also other topics of interest such as the care for their children and households, and how to make ends meet. These are important informal mechanisms of innovation transfer.

These informal channels of sharing new ideas are important among women for they are occupied throughout the day, which does not allow them to engage in other activities outside the main ones. Apart from that as already emphasized they are also constrained as to what they can or cannot do, and in their interaction with men in public spaces. This leaves them with no option but to go for informal ways of sharing new ideas. It must however be noted that men also share ideas on new agricultural innovations with their colleagues and male children. Unlike women the main channels used by men in learning about new and complex innovations such as IPM, have been through formal channels. Innovations are also transferred or diffused through groups that meet frequently and are well organized. According to the female informants, women's groups are more vibrant than men's and tend to be an easy means of innovation transfer. All the women interviewed in Kpasa and Tamalbila belonged to such groups which are often well organized. The ability of the group to cater for the needs of members often promotes group coercion. Unlike in Tamalbila, women's groups in Kpasa were eager to learn and share new ideas. As such, respondents in Kpasa had long been involved with innovation diffusion programs through groups, and were more willing to transfer to other people and eager to learn new innovations than women from Tamalbila. Amidu a-29-year-old male farmer and student from Kpasa indicated how women are included in innovation diffusion programs;

> *'The women's group leader, chairlady or organizer decide, with the existing group members which other women will join in innovation diffusion programs, as the chairlady herself has an automatic right to be part of any innovation diffusion program.' (Individual Interview, Northern Ghana, September 30, 2010)*

Adamu, a group member from Kpasa, said that, 'we have a vibrant group and hold meetings frequently to solve our own problems.' Azabu, a-42-year-old male farmer and household head from Kpasa, added that 'women have a very dynamic group which serves as a point of contact'. For a male household head to say this suggests that modernization is fast catching up with rural farmers, as it is normal for household heads to guide the rest of the household through the traditions, culture and norms of the society in which they belong.

The feeling and security of belonging to the best group attract and encourages participation. Shietu, a-57-year-old female farmer and group leader from Kpasa, indicated that her group is the best group in the community. Their group she explains is the most efficient and effective and that clears the space for life enhancement for its members. They are often targeted by the three agricultural development agencies, and some other Non-Governmental Organizations (NGOs) due to their readiness to welcome and adopt new and life enhancing attitude, mainly towards agricultural development programs. This is an indication that supports the concern of many agencies to use groups as the medium or vehicle through which information of new/improved innovations can be relayed to women and farmers in general. During group meetings, members discuss issues that affect their livelihoods and plan how to source new ideas that can boost their livelihood standards. These meeting are held as frequently as every two weeks to share new ideas. For instance, in Kpasa, there is a cowpea women's farmers group that provides help on cowpea storage and utilization methods. The group meets every two weeks to refresh themselves on what they already know, and to share new ideas on cowpea IPM. The group make concerted efforts hoping that their efforts will be noticed by NGOs that can assist them financially with farm equipment, new farming methods, and the sale of their farm produce through well organized groups who will buy at a higher price than usually offered them at the local market.

4.4. A growing independence

Finally, I will discuss women's growing independence, more specifically, how women are making efforts to liberate themselves from male dominance and control and how some men are supporting their efforts. This is made possible by the important role of women in the household and agricultural sectors and the support from their male counterparts as well as the three agricultural development agencies. Through group formation, women begin to liberate themselves. When women belong to a group, they share information on how to improve their wellbeing and gain support from their male counterparts and the three agricultural development agencies Alhassan from MOFA revelled.

Where women are denied access to productive resources it serves to lower their relative, if not absolute, productivity. This is particularly true for women in rural areas who are involved in subsistence farming as indicated from interviews with the three Agricultural development Agencies. As gathered from the agencies, there are still many instances of some men failing or refusing to understand that there is the need for women to develop themselves and be part of decision making at the family level. However there are growing numbers of men, even though not significant, who understand and welcome the idea of allowing women to gain their 'independence', and have come to support in the little way they can. For instance from observations from Kpasa, men were very instrumental in asking their wives to be present for the interviews

and also asked if there was anything I could do to help the women secure some loans, as they were very good at making good use of such facilities. However, there are examples of men in Kpasa who disliked and frown upon the fact that women are part of agricultural development programs. One of such man said to me in exasperation, 'you are those who are making it difficult for us to control our women. How does a woman make her own decisions when she is under the control of a man?'

From the individual interviews and FGDs it was noted that more women have come to understand that they need to encourage, support and be there for one another, which they do through group formation; where agricultural and advisory services are gradually passed through farmer's organizations. FGDs showed that women encourage each other at group meetings, sharing their experiences on how to overcome the dominance of their male counter parts. As a result, other women who are struggling to make ends meet without the support of their husbands will have to gradually learn from their colleagues in the group how they can coupe without their husband's support. It was indicated by the FGDs that through group formation, a lot more women have been encouraged to make ends meet without any support from their husbands. Naata, a female trader from Tamalbila, said that,

> *'We the women are already into groups in helping ourselves develop so when there is an innovation it is very easy to disseminate to our fellow women. The men usually feel that most of the innovations are male oriented and for that matter do not make efforts to include us. Most of the men do not also want to mingle with women in public, though some are doing their best to include us.'* (Individual Interview, Northern Ghana, January 17, 2010)

The FGD's in both study villages showed that a woman in the rural setting does not have a voice in the public setting and for that matter her husband must decide for her. During the individual interviews Martha, a-36-year-old female farmer from Kpasa showed that, it is men who decide whether or not an innovation is suitable for women depending on their interest in the innovation. Furthermore, if men are interested in an innovation that only women have access to, because women are secondary to men, they do not want to learn from women. Such men do not want to lose their sense of superiority over by women by seemingly stooping too low to learn from them. For example, if a man is found mingling among women, whether or not for a good reason, he is referred to a "*pu'abileriga*"; literally meaning that a women's cockroach: a derogatory description many men would avoid. However, during the FGDs Isshaq, a-50-year-old male farmers from Tamalbila, indicated that some men are there for their wives and will allow them to be part of most agricultural development programs irrespective of the names or descriptions other men in the community will label them. This, Isshaq said, happens where men are sympathetic towards their wives and also understand that their wives are helping in raising the livelihood standards of their households.

4.5. The IPM, FFS and the participation of women cowpea farmers

When cowpea FFS was introduced into these districts in the 1990s, male cowpea farmers were favoured. The criteria for selection included being a male, cowpea production, farming experience and the ability to communicate with others, so as to encourage learning and later dissemination of what had been learnt. These

criteria meant that women were effectively prohibited and excluded. These criteria are argued to have been due to the structure of the three Agricultural Development Agencies, where most of the staff involved in grass root innovation dissemination was male.

However, with the introduction of gender main-streaming in the 1990s, (according to data gathered from MOFA), the three agricultural development agencies began actively including women in their programs. Since the late 1990s, women have participated in the cowpea FFS in Tamalbila and the early 2000s for women in Kpasa. The inclusion of women in the cowpea FFS in the late 1990s and early 2000s saw both male and female farmers eagerly expressing their desire to know more about how to use the IPM innovations for cowpea cultivation and storage. Up until the time of this study, only 45 women were involved in the FFS in the two main study villages. This low level of participation of women was attributed to their multiple tasks on the farm and the household. Based on informants from the FGDs participating in study from both study communities, it reflected, in the case of married women, whether husbands decided their wives could attend. Those who attended, however, revealed that they were fully backed both by their husbands and other family member. The married women reported that not only did their husbands give their consent for them to attend and participate but also encouraged and shared equally with them, particularly, their on-farm roles. Memunatu, a-45-year-old female farmer from Tamalbila, indicated in the main interviews that, 'my husband and his elder brother, who is the household head, know that I do help a lot on the farm, so they allowed and encouraged me to learn the IPM innovations'. She continued, 'to date, these innovations have helped me and my household in controlling cowpea pest and disease during its cultivation and storage'. Sanatu, a-40-year-old female farmer from Tamalbila, explained in great clarity and eloquence through the main interviews that she 'had learnt a great deal from the FFS and applies the innovations on the cowpea and other crops on the field and at storage'.

The FFS, before and after the inclusion of women did not change. Azee, a-42-year-old female farmer from Kpasa during the FGDs indicated that women who were involved were expected to carry out all the activities that the men did. Members have always been selected for participation by the organizers. The organization of the FFS was detailed by Ababa, a-50-year-old male farmer from Kpasa during the main interviews: the three agricultural development agencies, together with the chiefs and elders of the village, farmer group leaders and the assembly men, played an essential part in organizing the training. They drew the planned sessions and selected farmers they thought could participate using a laid down criteria for selection. He further indicated that men always dominated in leadership positions at the village level. He further explained that the absence of women in the early stages of the introduction of IPM FFS reflects the lack of women's groups.

5. Discussions

5.1. The influence of gender on agricultural production and innovation transfer

This section discusses the influence of gender on agricultural production and innovation transfer, a focal issue in this paper. Findings from the research indicated that the main difference between men and women

lies in their domestic roles. They also indicated that both men and women are involved in agricultural production, with women taking active roles in planting, weeding, harvesting, storage, marketing, and food processing and preservation. Men are actively involved in clearing and ploughing of farmlands. Because of women's involvement in many agricultural activities, they are seen by agricultural development agencies as crucial to the subsistence and livelihood activities of most households in the study area. This finding supports Jackson's (2007) argument that gender specific roles in the agricultural sector distinguish female farmers from their male counterparts.

There were also indications that because women are very much involved on the farm and in their domestic duties, they spend more time working than men. From my fieldwork data, I estimated that women spend up to a total of 56 hours a week on farm and domestic labour, compared to men who spend an average of 42 hours a week on on-farm and off-farms activities. However, the study found that although women are heavily involved in the agricultural sector, they do not take on these active roles until they are married, when their husbands see them as an important source of labour. This is also shown in Latin America, where the local community's agricultural work was mostly done by females. Also in Asia, research suggests that many female systems of agricultural production are known to exist, especially among the native Indian tribes where women work significantly more hours than men (Whitehead, 1996). Similar findings have also been claimed for Ghana, parts of Malawi, Tanzania and Nigeria (Argawal, 1985).

In spite of the acknowledgement of women's economic contributions by agricultural development agencies, women were not usually granted direct access to valuable innovation. This was found to occur as a result of traditional norms and values which led, for example, to women's lack of access to digital agricultural machinery. The research literature indicates that agricultural policy can lead to a breakdown in local systems of innovation access and use (Shehu, 1997). This means that women can be given opportunities to learn how to use 'complex' innovations that are usually the preserve of men, and this is evident in the study area. Access to credit has also improved, to some extent, especially where women are no longer married, or are widowed, they are involved in decision-making and opportunities are opened to them since their strings are no longer attached to any man.

In terms of decision making, the study found that some women in Kpasa were much more involved in the agricultural sector than women in Tamalbila, and were taking farm management decisions on their own or jointly with their husbands. This can be attributed to modernization or what some informants referred to as enlightenment. Also, the realization by some men that women make a significant contribution to agriculture is also significant. However, this does not mean that farmers in Tamalbila are not modernized, enlightened or realize the contribution of women in the agricultural sector. It is just that men in Kpasa are more proactive in supporting their wives even though Tamalbila is close to a major urban centre: due to education, exposure to alternative ways of living, and nearness to the main urban centre, where stereotypes about women have begun to vanish.

The research literature further indicates that decision making was and is still the prerogative of men, especially in farming communities. The right of some women to make decisions in the study area can be understood in the context of the argument by Okali (2002) that ways are being sought to empower women in

the decision making process following women's involvement in development conferences. Conferences on women in development have certainly propelled and ensured the involvement of women in agricultural projects and their ability to make decisions within the household (Okali, 2002) has been manifested. Findings indicate that only a few men give their wives the opportunity to participate in decision making. Okali (2002) further argues that though much is being done to empower women, there has been little sign of women's greater influence over their social and economic wellbeing relative to men's.

This also indicated that women's contribution to agriculture is greater than the men's. This difference can be attributed to migration. Where men migrate in search of work, women are left behind to undertake all the remaining agricultural roles. In this case, where women by tradition are not allowed use of some farm tools it tends to affect their productivity negatively. However, if migrant farmers are able to send remittances back to their families the problem is somehow reduced as this money can be used to hire additional labour. In this situation, Boserup (1970) argues, women can take up roles that were previously occupied by men. Nevertheless, where there are traditional and customary constraints that limit women's access to innovation, there will be negative consequences on their agricultural productivity.

A number of reasons can be given to explain the increasing desire to involve women in agricultural programs by a wider range of agencies involved in agricultural development. The paper has pointed firstly to the emphasis productive and reproductive roles played by both men and women especially in the agricultural sector. Secondly, it has been argued that women are more willing than men to adopt new agricultural innovation, and to transfer them faster than men because of their reproductive roles. The agencies also expressed the view that women are quick to notice which innovations will work, and so are quick to adopt such innovations if they have the chance of accessing them. This is possibly because women are involved in almost all the farm activities and because of their intimate knowledge of many aspects of the agricultural production process According to Whitehead (1996) investments in the agricultural sector typically targeted men rather than women as it was thought that knowledge would be shared throughout the family. More recently, women have become the focus of considerable research and data collection because of their vast knowledge in agricultural production (Okali, 2002).

6. Conclusion

In this paper I have made clear the influence of gender on agricultural production and innovation transfer. The paper highlights in details how the three agencies influence the involvement of women in innovation transfer and diffusion programs, the role of women in cowpea production, and how women influence innovation transfer.

Women together with men are supported by the three agricultural development agencies to access new innovations and agricultural services. It can be concluded that despite women's efforts at improving on their position, more still has to be done by the three agricultural development agencies in involving men and women in their programs. There is the need to get the gender balance right to ensure equitable distribution of resources between men and women.

Where the division of labour is properly balanced and managed among men and women, women will have more time and opportunities. Women will have time to attend more training and refresher programs that can potentially enhance and improve on their contribution towards agricultural production. So therefore more focused training is needed for better burden sharing and an equitable division of labour between the genders. Nevertheless, the three agricultural development agencies and NGOs have made commendable progress but still need to invest more time and resources to make remarkable improvement in ensuring that women have access to agricultural innovations. By so doing, the yawning gap between women and men will be bridged and eventually eliminated. They need to look beneath the normal texture of customs and traditions to uncover ironies and oddities that mitigate against the progress of women in achieving their full potential in agriculture.

I have made salutary illustrations to buttress the point that most innovations developed actually do not take into consideration the needs of female farmers and thus render women farmers incapable of utilizing them. Where innovations are disseminated, the three development agencies should also consider planning the dissemination process to suit women work regimes and create the awareness among men that the role of women in agriculture serves to increase production for all.

Women are involved in all the household chores and most of the farm roles. Women, like men in these research villages are involved in all tasks associated with cowpea production - planting, weeding, fertilizer application, harvesting, transporting harvest, processing, storage. They also grow other crops, and are involved in performing household chores, like gathering wood, collecting water, cooking and looking after children.

Despite the efforts of the three agricultural organizations, inequalities between women and men in the villages persist. Some women are still not allowed to make decisions or to get involved in development programs without their husband's permission. Where culture and norms dominate in communities like these, more effort has to be put in to encouraging female participation. The universally acceptable boot camp adoption of cultural practices needs to be jettisoned in preference to well refined modern practices, but must be done cautiously in order not to incur the displeasure of chiefs and elders of the communities.

The norms and values of the three villages therefore place women/wives in a position where they have very little opportunity to take decisions on their own. The prevailing unwritten consensus is that men take decisions on behalf of women. Women need more education and information. The information revolution is the most subversive force any business sector has witnessed in recent times and must be used to the advantage of women. Detaching the umbilical cord of women from men by giving women the independence of thoughts will help the agricultural sector immensely.

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