Social Policies and Social Development: OSSREA Zambia Chapter Academic Workshop Proceedings, University of Zambia Senate Chamber, Lusaka, Zambia, 15th October, 2012, pp.121-144. ISBN: 978-9982-22-845-9

INFORMATION AND KNOWLEDGE: A PANACEA FOR INCREASED FOOD SECURITY AMONG WOMEN IN CHIPATA DISTRICT: THE CASE OF LUANGENI

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ABSTRACT

Women play a critical role in food security. They are the backbone of the world's agricultural labour force. Nearly half of the food grown all over the world is produced by women. In Zambia, women account for over sixty-five percent of labour in agricultural production. All tasks associated with food production, harvesting, processing, preparation, provision of water and fuel wood, food storage, transport, marketing, hoeing and weeding are largely performed by women. Taking into account all of women's agricultural work, one can arguably claim that women's contribution to food production increases spectacularly and generally surpasses men's contribution. Yet women in general experience greater difficulty than men in securing essential resources and basic resources such as health, nutritional services, education, physical and financial capital and land. Above all, women lack information and knowledge which is critical to enhance their contributions in food security. In addition, they remain the silent majority with limited access to economic decision making bodies that impact on their lives and the lives of their families. Given the opportunity, women's contributions to ensuring food security could increase substantially. Given increasing food insecurity especially in rural areas of Zambia, it was imperative to investigate whether women in Luangeni, Chipata District have information and knowledge on food security issues. The study was both qualitative and quantitative in nature. 135 women farmers participated in the study. The findings are presented and include an assessment of whether women farmers had information and knowledge on land rights and tenure, modern cost effective agricultural equipment, acquisition of agricultural inputs, market and nutritional value of locally produced food. The study further investigated the agricultural information and knowledge needs of women farmers, sources of agricultural information and knowledge of women farmers and the challenges faced to access agricultural information and knowledge.

Keywords: Food security, Food nutrition, Zambia, information access, Information sources, indigenous knowledge, agricultural development, women's health, Economic development.

1. INTRODUCTION AND BACKGROUND

In this information and knowledge dominated era, the role of information and knowledge in every human activity cannot be over-emphasised. They are prerequisites for informed action, be it at individual, institutional, national and global level. In fact, Stanley (1990) posited that information is one of the basic needs after air, water, food, and shelter and for any activity to

have a realistic chance of successful execution, it depends largely on the availability and access to accurate and reliable information. Thus, sustainable food security can only be achieved if people have access to information and knowledge.

Ensuring food security (the basic right of people to the food they need) is one of the greatest challenges facing the world community (FAO, 1998) and Zambia in particular. In Zambia, poverty and food insecurity are widespread in both rural and urban areas. However, food insecurity is more prevalent in rural areas where 80% of the poor resides (Republic of Zambia and United Nations Children's Fund, 2008). Despite the occasional surpluses the country has experienced over the last few years, thousands of rural people in Zambia still require food assistance. There are serious constraints in terms of access to food, coupled with the continuing inability of households to purchase food especially by the majority of the rural population. The bought or home-produced food is in most cases inadequate (GRZ and UNICEF, 2008) to take most families throughout the year. Additionally, they can hardly command food resources simply due to their insufficient purchasing power. The repeated experience of hunger and struggle to access food is fundamental characteristic of life (GRZ and UNICEF, 2008). According to GRZ and UNICEF (2008), 76% of food-crop farmers in rural areas are food insecure, predominantly women, enduring severe shortfalls during September to February lean season. Adding to this problem is high levels poverty, hunger and disease burden. Yet women's role in ensuring food security in any nation is pivotal.

Although rural women play a critical role in food security, there has been little attention to the information and knowledge needs and rights of women farmers. Access to information and knowledge, according to Primo (2003) is the third major concern facing women globally after poverty and violence against women. Women, particularly in rural areas have limited access to relevant information about food production and processing (Huyer, 1997), thereby restricting them from participating in the information society. In addition, women lack the needed technical knowledge to enable them derived productive use of farm input for optimum yield. In fact, Aina (1995) observed that agricultural information is available but there is the problem of lack of access to such information; and that information providers such as extension officers are unable to disseminate relevant information to farmers due to their inadequate numbers, the low literacy level of farmers and the general lack of infrastructure in the various rural communities of Africa. Munyua (2000) also found that women do not know where to find information and do not understand its impact when they find it; they are unable to identify the information environment, including the type of information needed, how to access it. However, Dasgupta (2001) observed that the need for information and access to information for women have not been taken as a serious concern.

The main objective of the study was to investigate if women farmers in Luangeni, Chipata District have access to information and knowledge on food security issues. The specific objectives included an assessment of whether women farmers had information and knowledge on land rights and tenure, modern cost effective agricultural equipment, acquisition of agricultural inputs, market and nutritional value of locally produced food. The study further investigated the agricultural information and knowledge needs of women farmers, sources of agricultural information and knowledge of women farmers and the challenges faced to access agricultural information and knowledge.

2. RESEARCH METHODOLOGY

2.1 Research site

Luangeni is one of the areas in Eastern Province with a population of more than 68,000 people. It is situated on the border with the neighboring Malawi on the eastern part of the province. It comprises five chiefdoms namely Mpezeni, Nzamane, Maguya, Chinyaku and Saili. The far-flung constituency is the nucleus of the Ngoni ethnic tribes. The area was selected on the basis that much of it is basically rural and agricultural-based, lacking social amenities such as standard medical facilities, good water supply, and good roads. It was assumed that many of the rural poor in Luangeni are smallholders and the majority of these are women who struggle with many constraints including limited access to land, markets, and agricultural inputs to mention but a few. The inhabitants of Luangeni are predominantly farmers and cultivate various crops such as maize, beans, groundnuts, soya beans, sunflower, and cotton among others. They are also engaged in livestock and poultry rearing. Further, there are other crops such as Irish potatoes, sweet potatoes and a variety of vegetables such as rape, tomatoes and cabbages grown in the area.

2.2 Research design

For this study, both qualitative and quantitative approaches were used. A field survey was employed to collect primary data. Fourteen villages were selected from which a simple random sampling of one hundred and thirty-five women farmers was generated. These villages included Mulonyeni, Shawa, Kangale, Kalichelo, Kunkhuli, Lulaka, Mtalimanja, Chinyama, Cakwila, Chithadza, Kaphinde, Msazula, Dulila and Mkwekwe. These villages were purposively chosen due to the fact that they could easily be reached by the researchers. A semi structured interview guide was used to collect primary data. To supplement the field data, secondary data was collected from various publications relating to the topic including books, journal articles and electronic resources such as CD-ROM databases and the Internet.

The quantitative aspects of data that was generated through questionnaires was analyzed using a well-tested package program known as the Statistical Package for Social Sciences (SPSS). Data obtained from key informants was qualitatively analysed and incorporated in the narratives contained in this paper.

3. CONCEPTUAL FRAMEWORK

It is assumed that access to agricultural information and knowledge among women farmers leads to food security. Burke and Hall (1998) define information as data that has been processed (for instance, by filtering, summarising or organising) to make it meaningful in a new way. Knowledge is neither data nor information, though it is related to both. Knowledge is information possessed in the mind of individuals: it is personalized information (which may or may not be new, unique, useful, or accurate) related to facts, procedures, concepts, interpretations, ideas, observations, and judgments, (Alavi and Leidner, 2001). It is the understanding that a person has gained through education, discovery, intuition and insight (Nickerson, 2005).

A person, household or community, region or nation is food secure when all members at all times have physical and economic access to buy, produce, obtain or consume sufficient, safe and nutritious food to meet their dietary needs and food preferences for a healthy and active life (International Federation of Red Cross and Red Crescent Societies, 2006). The analysis of food security takes into account food availability, access, utilisation (Republic of Zambia and UNICEF, 2008; Haddad, 1997) and stability (European Commission, 2009). The four are known as the three pillars of food security (GRZ and UNICEF, 2008). Food availability implies that sufficient quantities of food are available to people on a consistent basis; food access mean that people have sufficient resources to obtain appropriate foods for a nutritious diet; and food utilisation entails that people have sufficient knowledge and information of nutrition and care practices and access to adequate water and sanitation to derive sustenance food (Columbia University' School of International and Public Affairs, 2010). Food stability means there should be guarantee that access to food is safe from either the emergence of sudden shock (economic or climate crisis) or cyclical events (seasonal food insecurity) (European Commission, 2009).

4. LITERATURE REVIEW

4.1 Importance of information and knowledge in food security

The requirement of information and knowledge services in food security has been well recognised. The Food and Agricultural Organisation argues that sustainable food security is based less on material inputs such as seeds and fertilizer; rather, it is based on investing in people involved in their use. Thus, a critical factor in meeting the challenge of ensuring food security according to FAO is human resources development through knowledge building and information sharing (FAO, 1998). This is because information and knowledge are powerful tools that enable farmers put agricultural science and production inputs to best use in order to be food secure. Farmers require information and knowledge on supply of inputs, new technologies, early warning systems (drought, pests and diseases), credit, market prices and their competitors (Munyua, 2000). The information and knowledge revolution, according to Munyua (2000) is an intervention to reckon with that has the potential to ensure knowledge and information on important technologies, changes, latest results of agricultural research, methods and practices are put into the right hands. Munyua further contends that knowledge and information are basic ingredients of food security. Without information and knowledge, farmers cannot succeed in their agricultural efforts. Availability of information and knowledge help farmers to make meaningful decisions and solve problems effectively hence leading to sustainable agricultural production and food security (Kaniki, 1989). Additionally, agricultural information and knowledge results in sustainable agriculture productivity and bumper harvests for consumption within and outside the producing country leading to food security and foreign exchange vital for economic development of the country (Alemma, 1995).

4.2 Women's role in food security

Specifically, women play three significant roles in food security: food production, food access and food utilisation (Pan American Health Organisation, 2002). As food producers, women form the backbone of the world's agricultural labour force (Committee for Economic Development, 2003). Half of the food grown all over the world is produced by women. Specifically, women make up 67% and 70% of the agricultural labour force world-wide and

in developing world respectively. In Africa, women produce between 60-80% of food. While in Zambia they account for 70% of labour in agricultural production, (Civil Society for Poverty Reduction, 2006). All tasks associated with food production in Africa are largely performed by women. Generally, women in most African countries according to FAO (1996) provide 33% of the workforce, 70% of the agricultural workers, 60-80% of the labour to produce food for household consumption and sale, 100% of the processing for basic food stuffs, 90% of household water and fuel wood, 80% of food storage and transport from farm to village, 90% of the hoeing and weeding work and 60% of the harvesting and marketing activities.

In terms of food access, women ensure that each member of the family receives an adequate share of food. They are also primarily responsible for purchasing food, to which they devote their time and income (PAHO, 2002). When it comes to food utilisation, PAHO alludes to the fact that women are responsible for nutrition in the majority of homes. They decide what food to buy and how to prepare it. In most cases, food preparation involves a substantial amount of time for collecting fuel wood and preparing ingredients (PAHO, 2002).

Taking into account all of women's food security work, one can arguably claim that women's contribution increases spectacularly and generally surpasses men's contribution. Yet women in general face significant hurdles than men in securing essential resources such as financial capital, land and productivity-enhancing inputs and services (FAO, 1996). As such, most rural women are small scale farmers, and most (82%) of them are poor (GRZ and UNICEF, 2008). Above all, women lack information (Umeta, Lemecha and Mume, 2011; Quisumbing et al 1995) and knowledge which is critical to enhance their contributions in all aspects of food security. Therefore, they remain uninformed about many issues that affect food security and agricultural development in general. Social and economic constraints have placed barriers around their access to scientific and technological information. Additionally, the women folk do not have needed technical knowledge to enable them derive productive use of farm input for optimum yield (Okwu and Umoru, 2009). Thus, most women farmers labour without crucial support that could raise their agricultural productivity. Scarce inputs like credit, improved seeds, fertilizer among others rarely flow to women in rural areas. This calls for more empirical information that may assist planners in policy and decision making. It is in this vein that a need was felt to conduct a study on access to agricultural information and knowledge among women farmers in Luangeni in Chipata district.

5. RESULTS AND DISCUSSION

5.1 Socio-economic characteristics of the respondents

The socio-economic characteristics of the respondents examined include age, education level, household size and marital status. These are depicted in table 1 below. The majority of the respondents (45.9%) were aged above 40, while 32.6% of the respondents were aged between 31 and 40 years old. The analysis further reveals that 17% of the respondents were aged between 21 and 31 years and only 4.4% of the respondents were below 20 years.

Most respondents (46.7%) reported having no formal education. 43% of the respondents were educated up to primary level, 8.9% were educated up to secondary level and 1.5% were educated up to college level. No one was educated up to university level. Thus, most of the respondents were illiterate. In most cases, having no formal education is not only associated

with functional illiteracy but also high levels of food insecurity. The findings are in agreement with the observation by the Republic of Zambia (2005) that the majority of women in rural areas of Zambia tend to be illiterate.

The findings further reveal that the majority of the respondents (44.4%) had between 5 and 8 household members while 38.5% of the respondents had between 9 and 12 household members. A total of 12.6% of the respondents had household members of above 13 and only 4.4% of the respondents had between 1 and 4 household members.

Most of the respondents (43.7%) were married and 28.9% indicated that they were divorced or separated. 14.7% of the respondents reported being single and 13.3% of the respondents indicated that they were widowed.

Table1: Socio-economic characteristics of women farmers N=135

Characteristics	***Frequency***	***Percentage***
Age (Years)		
Below 20	6	4.4
21-30	23	17
31-40	44	32.6
above 40	62	45.9
Education level		
None	63	46.7
Primary	58	42.9
Secondary	12	8.9
College	2	1.5
University	0	0
Household size		
Between 1 and 4	6	4.4
Between 5 and 8	60	44.4
Between 9 and 12	52	38.5
Above 13	17	12.6
Marital status		
Single	19	14.1
Married	59	43.7
Divorced or separated	39	28.9
Widowed	18	13.3

5.2 Women's knowledge and access to information on land rights and tenure

The majority (80%) of women farmers as shown in table 2 indicated that they do not have information and knowledge on land rights and tenure while only 20% reported having access

to information and knowledge on land rights and tenure. These findings are similar to the observation by the Republic of Zambia (2009) that women face the challenge of inadequate information and knowledge on administrative and legal procedures and guidelines of acquiring land. The findings above also relate to the observation of Wikigender (2012) that one of the key problems relating to ownership of land by women is their lack of knowledge and information on statutory rights. In this vein, women's access to information and knowledge on land rights and land tenure is critical for them to own and make a greater contribution to food security and poverty reduction at large. Lack of ownership to land inhibit agricultural productivity and consequently affect food security. To enhance their access to and control of land, women need to be aware that in Zambia, a dual legal land tenure system is the basis for land administration: state or crown and customary or tribal. State land is the land under the jurisdiction of the president, while customary land is the land under the jurisdiction of the traditional leadership. In addition, women should be aware that that they have a right to access land. The Ministry of Lands has devised a policy which provides that 30% of statutory or titled land that is made available for development should be reserved for women (Republic of Zambia, 2005) as well as allowing women to compete for the remaining 70 percent.

Table 2: Women's access to information and knowledge on land rights and tenure

Response	***Frequency***	***Percentage***
Yes	27	20
No	108	80
Total	135	100

5.3 Information and knowledge of modern cost effective agricultural equipment

Rural farming is one of the most difficult activities that those, whose lives depend on it, face each year. The difficulty mainly is due to the fact that tilling of the land is mainly done using hands, except for a few who may have oxen and those who may have money to hire oxen for ploughing. Because of lack of tools to use in their farming, it is difficult for most rural farmers to cultivate big areas of land. As a result, their agricultural produce is limited. Thus, the study further sort to elicit information on whether women have knowledge and information on cost effective agricultural equipment in Luangeni. The majority (75.6%) of the respondents indicated that they have no knowledge and information on cost effective agricultural equipment while only 24.4% indicated that they have knowledge and information on cost effective agricultural equipment.

The findings show that most respondents have no information and knowledge on modern equipment that can be used to increase their production. According to Wamundila and Mulauzi (2010), a number of modern equipment that can perform farming activities easier and sometimes perform multiple tasks is now available on the market. An example of such equipments is the Power tiller, an agricultural farm implement that can be used for farm activities such as watering, tilling, disking, cutting and planting. This machine is handy and currently has been distributed by Micro Bankers Trust at affordable price. The implement has actually been used by some small scale farmers along the line of rail and those who live near urban areas. In addition, the government through an initiative called the Agricultural Sector Investment Programme runs a programme called Smallholder Agricultural Mechanization Promotions (SAMeP).

The SAMeP project also deals in many various agricultural implements including the SAMeP adjustable cultivator**,** an implement used to break up the soil. These equipments can be used to cultivate large areas of land with less effort and can enable small scale farmers produce and sale a lot of crops on a large scale. Thus, lack of such important information is indeed, a big disadvantage to women farmers, who, despite having fertile soils are unable to utilize it fully.

For those who cannot afford these equipments government can establish mechanisation centres from which they can hire such equipment at a subsidised cost.

5.4 Information and knowledge on access to agricultural inputs

Results from the field reveal that most respondents (91.1%) have information and knowledge on access to agricultural inputs. 8.9% of the respondents indicated that they do not have information and knowledge on how to go about accessing agricultural inputs. However, the study revealed that respondents face the difficult of financial resources to belong to cooperatives and limited agricultural inputs as narrated by one of the respondents:

> *We have information and knowledge on how to go about accessing inputs...We need to register with cooperatives who assure us of inputs...like this year, we were made to pay K100, 000 per individual for shares.... K30, 000 for cooperative membership...K100, 000 for two bags of fertilizer...the problem is that it is hard to find these monies if you are to be a member...Only a few affords to be members of cooperatives...*
>
> *There are delays in receiving inputs...we are given one bag and half per individual...a 10kg bag of seeds is share among six people...*

This entails that most women are unable to access government organised inputs which are normally distributed through cooperatives (Republic of Zambia, 2009). The findings are the same as those of FAO (1996) who observed that women's access to technological inputs such as improved seeds, fertilizers and pesticides is limited. They are rarely members of agricultural cooperatives which often distribute government subsidized inputs to farmers and they lack the cash income needed to purchase inputs even when they are subsidized (FAO, 1996: Republic of Zambia, 2009).

5.5 Access to information and knowledge on market

In terms of access to information and knowledge on markets, findings from the field show that most (70.5%) respondents indicated not having access to information and knowledge on markets. Only 29.6% of the respondents reported having access to information and knowledge on markets. This shows that women have limited access to markets. In fact, the study further revealed that women (100%) are not aware that they can actually contact shops like Shoprite to supply their products like tomatoes and other vegetables. Indeed, this affirms the fact that women farmers of Luangeni are not well informed on where they can market their produce. They lack clear information on marketing opportunities, skills and trends. Although women go out of their way to ensure food sustenance for their families and also raise monies for activities such as paying school fees for their children, it is sad, to note that

they do not sell their produce at times due to lack of readily available markets. In situations where agricultural produce is sold, most often the prices for such commodities are not competitive.

In terms of other difficulties women face to access the market, respondents had the following to say:

> *You know, the markets are far...transport is a big problem...we are charged K4, 000 per bag to transport our produce to the market… we have to provide own empty bags...The markets in the constituency are sparsely located.... It takes almost a month to sell our produce. Those with money corrupt the officials to have their produce sold quickly.*

It is clear that women in the study area face other difficulties such as high transport costs, distance to the markets and difficulties in actual selling of the produce at the market. In fact, the findings further revealed that the road network is poor in the area. This implies that even women close to points of sales might also experience high cost of transportation due to poor access to roads among others thereby increasing production cost. The roads in the area are not tarred including the major road stretching from Chipata to Chadiza. Farmers are no near to tarred roads and heavily depend on inadequate and poorly maintained feeder roads. The poor condition or roads which are often impassable during the rainy season is a major constraint to the efficient marketing of produce and therefore, a significant constraint to achieving food security among women in the study area. Additionally, women bear the primary responsibility of household labour and childcare and the nature and quantity of their work does not allow them the same mobility and time availability as men (FAO, 1996). They lack the cash income needed to transport their produce to markets. In most cases, women often have to walk long distances to markets with their produce on their heads. According to GRZ and UNICEF (2008), accessibility to markets and services is a critical determinant of household food security. The more remote a household is located, the more vulnerable it is to food insecurity. Thus, households in remote areas more than 6 kilometres from a tarred road tend to be food insecure and most children tend to be stunted. In fact, poor road infrastructure restricts the flow of from surplus to deficit areas.

5.6 Knowledge and information on the nutritional value of locally produced foods

In order to be able to be able to prepare a balanced and nutritious diet it is important for women particularly farmers to know the nutritional value of common foods. In this regard the study investigated women's information and knowledge on the nutritional value of the locally produced foods. The findings are depicted in table 3 below. The findings reveal that 44.4% of the respondents have knowledge and information that beans provide protein and carbohydrates; 40% have knowledge and information that root vegetables provide carbohydrates and vitamin C; 33.3% have knowledge and information that grains provide carbohydrates, protein and vitamin B; 22.2% have knowledge and information that milk provide calcium and vitamin D; 38.8% have knowledge and information that eggs provide protein and fat; 34.1% have knowledge and information that fish provide protein and fat; 45.2% have knowledge and information that meat provide protein, fat, vitamins A, B and D and minerals such as iron; 28.1% have knowledge and information that fruits provide carbohydrate and vitamins C; 36.3% have knowledge and information that green vegetables provide carbohydrate, vitamins and minerals including iron; and 37% have knowledge and information that seeds and nuts provide fat, carbohydrate, protein and minerals.

Table 3: Nutritional value of locally produced foods

Type of Food	***Nutritional value***	***Frequency***	***Percentage***
Beans (i.e. soya beans and ordinary beans)	Protein and carbohydrate	60	44.4
Root vegetables (e.g. Cassava, sweet potatoes and Irish potatoes	Carbohydrate and vitamin C	54	40
Grains (e.g. rice ,millet, Maize and sorghum)	Carbohydrate, protein and vitamin B	45	33.3
Milk	Calcium and vitamin D	30	22.2
Eggs	Protein and fat	52	38.5
Fish	Protein and fat	46	34.1
Meat	Protein, fat, vitamins A, B and D and minerals such as iron	61	45.2
Fruits (e.g. oranges, lemons, bananas, guavas, mangos, water melon)	Carbohydrate and vitamins C	38	28.1
Green vegetables (e.g. Carrots, tomatoes okra, onions, cabbage, rape)	Carbohydrate, vitamins and minerals including iron	49	36.3
Seeds and nuts(e.g. sunflower, groundnuts and cashew nuts	Fat, carbohydrate, protein and minerals	50	37

The findings indicate that women have information and knowledge on the nutritional value of locally produced foods. Although women have knowledge and information on the nutritional value of these locally produced foods, findings of the study revealed that they have difficulties to prepare the foods in a manner that would retain their nutritional content due to the fact that they are hardly visited by a nutritionist. In addition, women revealed that they find it difficult to provide a balanced diet due to the seasonal nature of certain foods e.g. fruits and limited financial resources to purchase these foods from the market.

However, it is important that women prepare a balance diet (i.e. one that contains the correct proportions of carbohydrates, fat, proteins, vitamins and minerals) for their families. A balanced diet does not have to be expensive.

5.7 The agricultural information needs of women in Luangeni

The areas of agriculture where majority of the respondents needed information include weather pattern (91.9%), best farming methods (89.6%), credit availability (85.2%), prices of produce (82.9%), marketing of produce (80%), access to inputs (74.8%) and disease and pests (74.8%). Other areas of agricultural information needs that were mentioned include crop and livelihood diversification (73.3%), soil management (68.1%), storage methods (66.7%), land tenure (57.8%) and processing of produce (41.5%). The results are shown in table 4 below.

Table 4: Agricultural information and knowledge needs of women

Information need	***Frequency***	***Percentage***
Disease and pests	101	74.8
Marketing of produce	108	80
Prices of produce	112	82.9
Storage methods	90	66.7
Processing of produce	56	41.5
Land tenure	78	57.8
Best farming methods	121	89.6
Crop and livelihood diversification	99	73.3
Access to inputs	101	74.8
Credit availability	115	85.2
Weather pattern	124	91.9
Soil management	92	68.1
Other (s)	0	0

Looking at the agricultural information and knowledge needs of female farmers in Luangeni, it is imperative to ensure that these are met at all cost. Information and knowledge is crucial for women to not only increase their agricultural produce and productivity but also ensure food security at household and national levels. By and large, information and knowledge can also bring about social and economic change among women farmers in rural areas. It is worth noting that most developing countries like Zambia have not devoted adequate attention to meeting the information and knowledge needs of rural dwellers especially women despite their critical role in food security. In today's information and knowledge era, it is important to ensure that information and knowledge initiatives and policies are tailored towards strengthening the grass roots with special emphasis on women.

5.8 Sources of agricultural information and knowledge for women in Luangeni

The findings regarding the sources of agricultural information for women in Luangeni are depicted in Table 5 Respondents access agricultural information through fellow farmers (52.6%), women's groups (31.9%), newspapers (1.5%), mobile phones (84.4%), television (3.75%), radio (87.4%), agricultural show/workshops (29.6), agro-shops (5.9%), extension agents (31.1%) and agricultural cooperative societies (28.1%).

Table 5: Sources of agricultural information and knowledge

Source	***Information gotten from source***	***Frequency***	***Percentage***
Zambia Agricultural Research Information Development Network	Nil	0	0
Fellow farmers	Market, farming inputs, farming methods and pesticides	71	52.6
Women's groups	Farming inputs, livelihood diversification, farming methods	43	31.9
Newspapers	Market, distribution of farming inputs	2	1.5
Libraries or information centres	Nil	0	0
Mobile phones	Market, farming inputs, farming methods and pesticides	114	84.4
Television	Farming methods, weather patterns, market	5	3.7
Radio	Farming methods, weather patterns, market	118	87.4
Agricultural show/workshop	Seed varieties, farming equipment,	40	29.6
Agro-shops	Pesticides, farming inputs, farming equipment	8	5.9
Extension agents	Farming methods	42	31.1
Agricultural Cooperative Societies	Market, farming inputs,	38	28.1
Internet	Nil	0	0
Other (s)	Nil	0	0

5.8.1 Appropriateness of preferred sources of agricultural information and knowledge

The fact that they indicated fellow farmers as one of the commons of accessing agricultural information may be as a result of the multiplier effects of fellow farmers in disseminating agricultural information and interpersonal interactions of the farmers (Agwu and Adeniran, 2009). It is also clear from the findings that women access agricultural information through radio. According to Mulauzi and Albright (2009), radio is an effective tool for providing and enabling access to information and knowledge to all segments of society particularly women. The ability of radio to reach many people makes it possible for the majority of rural masses including women to benefit from the information including those who are not accessible by road or in terms of print. In addition, radio and television is cheaper, accessible and provides cost effective means of providing and accessing information for self development as well as national development (Greenberg, 2005). Further, radio overcomes barriers to infrastructure, language, light, water and skills to operate and use it (Gerster and Zimmermann, 2003) and is more appropriate and adaptable to the local needs (McNamara, 2003). Radio content is cheap to create and cheap to consume, and neither the creators nor the consumers of radio content

need to be able to read or write due to the oral nature of radio. It is possible to transmit radio content in local languages (Githaiga, 2005). Mobile phones also constitute the primary source for information due the fact that it is easy to operate and supplies an immediate need for communication with no limit on time and space (Mulauzi and Albright, 2009). Unlike landline phone, mobile phone is easier and cheaper to acquire. It is also widely accessible and more relevant to the local needs and unlike Internet, mobile phone allows individuals to communicate in their own local languages thereby enabling people to access information in their local language, (Wakunuma, 2007). Apart from agricultural shows or workshops, Agricultural cooperatives societies, the other common sources agricultural information women use is extension agents due to the fact that messages from extension agents most often enhance adoption of innovations (Agwu and Adeniran, 2009).

However, the findings reveal that Zambia Agricultural Research Information Development Network (ZAR4DIN), newspapers, libraries and information centres, television, agro-shops and Internet are hardly use for accessing agricultural information. The non- availability of e-mail and internet facilities, television and libraries and information centres in rural areas may have accounted for farmers' perceived non-appropriateness of these channels, which further points to the need for these facilities in the rural areas. In fact, libraries and information centres are not convenient for women in terms of mobility and time (Mulauzi and Albright, 2009). In addition, low literacy rate among rural women makes it difficult for them to access information in print. ZAR4DIN is one of the potential sources of agricultural information and knowledge farmers can reckon with. Launched in 2010, Zambia Agricultural Research Information Development Network facilitates access to institutional repositories of Agricultural Research for Development information through a national AR4D portal. ZAR4DIN periodically imports agricultural information from the three Institutions namely the Zambian Agricultural Research Institute (ZARI), the National Institute for Scientific and Industrial Research (NISIR) and the National Agricultural Information Services (NAIS) and gives access to them through a search engine.

5.9 Challenges women face to access agricultural information and knowledge in Luangeni

According to the findings, women have barriers to language, illiteracy, format, lack of relevant content, lack of information literacy skills, timing, lack of basic infrastructure, distance and cost. However, it is clear from the findings that the major barrier to access agricultural information for the majority of the respondents (90.4%) as shown in table 6 is language, followed illiteracy (85.2%) and timing (81.5%) of the agricultural programmes on radio stations. The findings further reveal that 77% of the respondents face the problem of lack of basic infrastructure to listen to radios or watch television programmes. 75.6% face the problem of format. A total of 71.9% of the respondents face the problem of lack of relevant content. 68.9% of the respondents face the problem of distance, 53%) face the problem of cost and 45.9% lack information literacy skills.

Table 6: Challenges women face to access agricultural information and knowledge

Source	***Frequency***	***Percentage***
Language	122	90.4
Illiteracy	115	85.2
Format	102	75.6
Lack of relevant content	97	71.9
Lack of information literacy skills	62	45.9
Timing	110	81.5
Lack of basic infrastructure e.g. electricity supply, road networks and communication facilities	128	94.8
Distance	93	68.9
Cost	72	53.3
Other (s)	0	0

The findings above are similar to Hakazi (2004) who argued that various factors such as illiteracy, lack of television sets, radios and computers for information in electronic formats; time for accessing agricultural information; and the lack of basic infrastructure, such as adequate electricity supply, road networks and communication facilities hinder farmers from accessing and obtaining agricultural information. To start with, language is a significant obstacle for many women to access information. Most of the information available provided is predominantly in English thereby excluding the majority people especially women in rural areas who do not know how to read, write or speak in English. Secondly, illiteracy is a fundamental barrier to information access. The majority of women farmers in rural areas are illiterate. This implies that they are disadvantaged to participate in the information and knowledge society. In terms of format, there are various formats of information resources including print (books, periodicals and microforms), multimedia (videotapes, audiocassettes, slides, and other image and audio formats) and electronic (CD, DVD, and databases). The format in which information is presented seems to be an obstacle for women to access agricultural information. For instance, information presented in print form may not reach most rural people to high levels of illiteracy. Besides, the poor reading culture in Zambia entails that most people can hardly read agricultural information presented in print format.

The agricultural information needs of rural women differ from the information accessible in most of the existing sources. It lacks relevant content that meets the information needs of women in a usable form. This obviously implies that there is very little agricultural information in most sources that would meet the needs of women farmers. In addition, effective and innovative use of ICTs to access development information requires information literacy skills, ICT skills, literacy and language. Information literacy basically entails the ability to recognise the need for information, locate, evaluate, access, communicate and use knowledge and information in varied contexts. Women than men often lack this skill (Primo, 2003). Kirkup (2002:11) argues that "access to information is a useless resource if you don't have the skills to evaluate and use it." Literacy, according to Batra and Grove (1994) is a

basic tool for communication and learning, for acquiring, sharing and exchanging information and knowledge. It creates quest for information, self learning and understanding thereby generating the demand for information services.

Furthermore, since most agricultural information is aired during the day when most farmers are working in the fields, timing of such programmes tend to be one of the barriers for women to access information. It also important to mention basic infrastructure such as electricity supply, road networks and communication facilities are lacking in most rural areas making it difficult to access information. It has been observed by Hafkin and Odame (2002) and Primo (2003) that all information resources cost money. Women in most cases lack disposable income to forfeit for access to information because they tend to give more attention and higher priority on household needs such as food, health, education and clothing other than information. Moreover, since most information facilities are located at far distant places or outdoor, and because of the multiple roles and heavy domestic responsibilities women are involved in, mobility and distance tend to be some of the barriers for women to access information.

6.0 OBSERVATIONS

(i) Most women farmers do not own land partly due to lack of information and knowledge on land acquisition process.
(ii) The majority of women farmers do not have knowledge on utilisation of modern agricultural equipment.
(iii) Manufacturers tend to introduce sophisticated and expensive farm technologies which most women farmers are neither able use or procure.
(iv) Women farmers in the study area do not use ZAR4DIN, libraries and Internet as sources of agricultural information and knowledge.
(v) The area lacks information hubs or information technology centres for accessing relevant agricultural information.
(vi) most agricultural cooperatives are headed by men
(vii) Most women farmers do not practice conservation farming method.
(viii) Generally, women have limited access to agricultural information and knowledge in rural areas
(ix) The majority of women lack necessary skills, low cost training and knowledge to effectively and innovatively access and utilise agricultural information and knowledge
(x) Much of the agricultural information and knowledge lack useful content based on local agricultural information and knowledge needs of women
(xi) Much of the agricultural information is provided in English.

7.0 RECOMMENDATIONS

(i) Women in rural areas should be adequately sensitised on land rights and tenure systems for them to own land in order to increase their productivity. This can be done through radio and mobile phones which are popularly used for accessing agricultural information.
(ii) Women should be provided with sufficient information and knowledge on modern agricultural equipment to make their farming activities easier and enhance their agricultural produce through the agricultural extension officers because they are

people on the ground able to explain in local languages on the use of modern equipment.

(iii) There is need for manufacturers to come up with agricultural technology which is simple, cheap and easy to use by smallholder farmers such as women. This can be done by consulting women themselves on the needed technology.

(iv) Women should take advantage of ZAR4DIN, libraries and information centres as well as the Internet since they provide valuable agricultural information and knowledge.

(v) Information providers should consider establishing information hubs or information technology centres in places where they can be easily accessible to farmers and also operate based on farmer demand. This would empower farmers to negotiate for higher prices for their produce, gain access to inputs at the right time and get advice from experts on issues that arise during the production and marketing cycles. In addition, these information hubs or centres should be tailored to the social, economic and cultural settings of farmers.

(vi) Women should be empowered through equal representation in decision-making bodies especially at local level in rural areas e.g. cooperatives. In fact, a certain percentage of leadership position can be reserved for the female folk.

(vii) Women need to adopt conservation farming as a way to improve food security.

(viii) Women, being integral to food security of any nation need to access agricultural information and knowledge vital for their effective contribution in all aspects of food security.

(ix) There is need to provide women with the necessary skills, low cost training and knowledge to enable them effectively and innovatively access and utilise information and knowledge. This can be done through field days.

(x) There is need for production and dissemination of relevant and useful content based on local agricultural information needs of women for information to be of value to the majority of women. This should be done in close consultation with women.

(xi) There is need to increasingly make accessible agricultural information in local languages so that the majority of women unfamiliar with English can access information, and

(xii) Government should establish mechanisation centres from which farmers especially women can hire agricultural equipment at a subsidised cost.

8.0 CONCLUSION

The paper has shown the critical role of women in food security and the importance for them to access information and knowledge. However, their active role in maintaining food security is inhibited by limited access to information and knowledge on various aspects of food security. The recommendations that have been offered, if carried out will result in strengthening of women's role in food security.

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