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A Gender Framework for Ensuring Sensitivity to Women's Role in Pulse Production in Southern Ethiopia

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Abstract

The main objective of this paper is to highlight components of a gender framework developed to guide a Canadian International Food Security Research Fund (CIFSRF) project that sought to address food security through pulse productivity and nutrition in southern Ethiopia. The framework was developed based on baseline data collected from 665 households randomly drawn from four pulse growing districts of Ethiopia (Damot Gale; Halaba; Hawassa Zuria; and Adami Tulu Jido Combolcha). The descriptive analysis shows that female-headed households owned significantly lesser land, livestock and other important strategic resources compared to male-headed households. Moreover, women's role was found to be less valued in pulse production, with local cultural practices limiting them from benefiting economically from the sale of pulses. The gender framework in this paper indicates five key gendered pillars for improving pulse productivity/management and nutrition; namely, knowledge, skills and training acquisition; participation in production and decision-making; access to resources; control over resources; and policy development. Finally, the framework underscores the importance of taking into account gender differences in terms of access to land, technologies and other strategic resources in pulse crop productivity/management and related interventions.

Keywords: access and control of resources, food security, gender framework, pulse productivity, southern Ethiopia

1. Introduction

Pulse crops are important components of crop production in Ethiopia's smallholders' agriculture, providing an economic advantage to small farm holders as an alternative source of protein and other nutrients, as well as cash income that seeks to address food security (Ferris & Kaganzi, 2008; IFPRI, 2011). The major types of pulse grown in Ethiopia, faba bean (*Vicia faba* L.), field pea (*Pisum sativum* L.), chickpea (*Cicer arietinum* L.), and lentil (*Lens esculenta* Moench) are categorised as highland pulse and grown in the cooler highlands while haricot bean (*Vigna radiata* L.) is predominantly grown in the warmer and low land parts of the country. The share of area cultivated for pulse production increased by 6.6 per cent a year during the period 2003/04-2008/09 which was a faster growth period compared to the yearly cereal area growth of 4.6 percent (IFPRI, 2011).

In recent years, Ethiopia has been listed among the top ten world producers of pulses, the second-largest producer of faba beans after China, and the fifth to sixth largest producer of chickpeas (FAO, 2010). Pulse production constitutes the third-largest export crop after coffee and oil seed (CSA, 2008; IFPRI, 2010). The three prominent regions with high levels of pulse production are Amhara, Oromiya and Southern regions. The Southern Nations Nationalities and Peoples Regional (SNNPR) contribute 10% faba bean, 18 % field pea, 3% chickpea and 15% of the haricot bean (CSA, 2010).

Despite the significant and growing role of pulse production for the economy at both micro and macro levels, studies conducted in different regions in Ethiopia indicate that production of pulse is severely constrained by access and control over key resources and opportunities (Fernando, 1998; Amanuel & Daba, 2006; Getachew et al., 2006; Haileslassie et al., 2007; MoARD, 2008). FAO (2010) has indicated that rural women and men have long and very different work experiences, with women lagging behind men in access to land, credit, and a broad

range of technologies and training resources.

In Ethiopia, as in other low income countries, the agricultural sector is essential for the stimulation of growth, poverty alleviation, and food security. Rural women in Ethiopia often face social, cultural and at times, legal constraints that limit their capacity to effectively participate in farming, natural resources management and decision making. Moreover, the traditional role of women puts gender specific constraints on access to resources such as fuel wood, water, post-harvest activities, and livestock management (Dejene, 2003; Teshome & Devereux, 2005). Women's contributions to crop production are not just qualitatively but quantitatively invisible as well. Statistics on women's yields, women's technology adoption rates, and women's use of inputs are rarely reported. A MoARD (2010) study indicates that Ethiopian women contribute over 65% to crop production, storage and processing, but they simultaneously, confront "invisibility" of their role.

The gender disparity in access to input through extension service is also notable. Agricultural extension services still do not attach equal importance to providing services to women farmers or women on farms. A study by Habtemariam (1996) showed that only 37% of women farmers have participated in extension advice and training. Policy makers and administrators still typically assume that men are the farmers and women play only "supportive role" as farmer's wives. According to Habtemariam (1996), women's participation in home economics is much greater (76.9%) than their participation in extension training (36.9%). Even in extension trainings, the main emphasis is on family planning (30.2%), child care (17.9%) and sanitation (17.6%) while ignoring field crop production or livestock management in which women are also actively involved. The notion that women are "weak farmers" further limits their access to extension and other services including credit, inorganic fertiliser (such as urea and DAP) and improved seed. Bethel et al.'s (2013) recent study in pulse growing zones of Ethiopia showed that women farmers were significantly influenced by certain constraints ($p < 0.01$) in pulse crop resources and technologies such as low participation in extension programs and other social activities, poor access to credit, low access and ownership of media instruments, less involvement in any activities of formal and informal organisations and less support from extension agents as source of information.

Female-headed households and female farmers in male-headed households represent a large production resource in the agricultural sector, particularly in pulse cropping. Yet many studies in this field indicate that men are the key players in crop and livestock production, and are also the principal beneficiaries in terms of control over the income generated from the sale of produce (ILRI, 2010; Yenealem et al, 2014; Gete et al., 2015). According to Asfaw et al. (2010), the opportunity for smallholders to raise their incomes from agricultural production largely depends on their ability to successfully participate in the marketplace exchange which is usually complicated by the numerous internal and external challenges. A recent study by Canadian International Food Security Research Fund's (CIRFS) project staff (Tefera, 2014) was conducted in three districts of SNNPR namely: Hallaba Woreda, Hawassa Zuria, and Damot Gale districts and in one district of Oromia region (Jido Combolcha). It revealed that among those who produce pulse crops, about 85% were male heads of household while only 15% were female heads of household. The finding from the multivariate analysis of the same study indicated that being female head of households reduced the likelihood of pulse (chickpea) market orientation by 0.331 compared to their male heads of household (Tefera, 2014).

Despite several efforts by governmental and non-governmental organisations to narrow the gender gap between male and female farmers, the role of women in pulse production and their access to necessary resources and technologies are still constrained. Empowerment of rural women is crucial, in part because of the link of pulses with improved household nutrition, as women are more likely than men to invest in children's health and nutrition. As well, women who are reached by agricultural interventions that relay information on nutrition, including pulse benefits appear to be particularly effective in improving nutrition outcome for their households (Yenealem et al., 2014; Tefera, 2014). As improving access to agricultural resources leads to a significant improvement in agricultural production, Ogato et al. (2009) have argued for a strong institutional support to ensure that key production resources such as land and water are given priority for these female farmers. A gender framework is an important and appropriate tool to anchor gender aspects in project design and implementation.

In order to address gender inequality and its relationship to pulse production for nutrition security, a gender framework was developed as an integral part of an ongoing collaborative project between Hawassa University (HU) and the University of Saskatchewan (UofS), and aimed at mitigating protein- and micronutrient deficiencies in Ethiopia by promoting food security strategy using pulse-centred technologies at the household level. To date, the partner institutions have successfully identified new and improved varieties of haricot bean and chickpea, and engaged farmers in soil management practices for increased pulse production (through identification and promotion of *Rhizobia* inoculants). The framework is aimed at addressing key gender-based intervention strategies to increase pulse production and its positive impact on health and nutrition outcomes. It is

framed to address the knowledge gap, problems of access and control of key household resources, gaps in the participation of women in pulse production and marketing, and influence policy.

2. Materials and Methods

The study on which the gender framework is based involved the use of baseline information collected from 665 sample households selected from four study districts of two regions: three districts of Southern Ethiopia/SNNPR and one district of Oromia (named above).

The study districts were purposefully selected from the large CIFSRF project sites (CIRSFR, 2014; Henry & Sheleme, 2013). However, when selecting the kebeles (a smaller administrative unit in a district), a random sampling technique was used. Accordingly, from the total list of kebeles in each district, 2-3 kebeles were selected based on their total size. The Kebeles selected included: Damot Gale district (Taba, Gacheno, and Ade Koisha); Halaba district (Kufe, Holageba Koke, and Gufessa); Hawassa Zuria district (Tunkaka Umbulo, Umbulo Wacho, and Omoshe Humo) and from Jido Combolcha district (Oda Anshura and Hurufa Lole). Once the Kebeles were drawn up, during the second stage of sampling, 150 households per district were randomly selected from the list of selected Kebeles to arrive at a total sample size of 600 witha further contingent of 65 households added to the sample.

The development of the gender framework involved the analysis of baseline data generated through household survey tools and checklists involving household heads, focus group discussions and interviews held with key informants from the four study districts. The main quantitative data were generated through household survey questionnaires designed to collect information on background characteristics of households, demographic characteristics of respondents, crop production, consumption and marketing of produced crops, decision-making in pulse production and pulse consumption, pulse preparation, household diet, and animal feeding practices. Key informant interviews were held at district and village levels. At district level, experts from the Bureau of Agriculture and Rural Development working on pulse management and monitoring, were interviewed on key issues related to pulse production and management. At the kebele/village level, key informants included extension workers, administrators and women representatives. Eight focus group discussions (two in each district) were conducted: separate focus group discussions for males and females were arranged. The female groups included married women, female heads of households, young girls and community leaders. The quantitative data were analysed using simple percentage (univariate) and Pearson's Chi-square analysis (bivariate), and the data were processed using SPSS software. The qualitative data were used to support the quantitative results.

3. Results

Findings from the baseline study indicated that 69 percent of the households were headed by males while the remaining 31 percent were female-headed (See Table 1). With regard to the household size, 45% of the households had 4-6 members followed by > 6 at 44.4% and only 10.7% reported having a size of < 4, giving a mean household size of 6.27 for the sample households. In terms of age distribution of the households' heads, those in early adulthood accounted for 23.5%, middle adulthood 56.8%, late adulthood 12.6% and a small proportion of 1.8% as aged. It was observed that 13.7% of the households were in polygamous marital relationship (where the husband had two or more wives). As expected, a larger proportion of the polygamous households were female-headed (26.6 %) than the male headed (only 7.9%).

A striking observation from the data in Table 1 was the very high rate of illiteracy. The data revealed that about 60 % of the respondents could not read or write. When the data was disaggregated by sex, 87% of female respondents, compared to 47 % of male respondents, fell under this category. There is also significant percentage difference in access to the most common media (radio) where more than 60% of the female respondent reported never listened radio during a reference period compared to 36.7% for the male respondents.

Table 1. Percentage distribution of background charcterstics by headship (n = 665)

Characteristics	Headship		
	Male (n = 458)	Female (n = 207)	Total (n = 665)
Household size			
0-3	9.8	12.6	10.7
4-6	40.8	54.1	45.0
6+	49.3	33.3	44.4
Total	100.0	100.0	100.0
Age of the respondents			
Age 15-24	5.0	5.8	5.3
Age 25-34	24.5	21.3	23.5
Age 35-49	56.1	58.5	56.8
Age 50-64	12.0	14.0	12.6
Above age 64	2.4	0.5	1.8
Total	100.0	100.0	100.0
Marital form			
Polygamous	7.9	26.6	13.7
Monogamous	92.1	73.4	86.3
Total	100.0	100.0	100.0
Educational level of the respondents			
Literate	52.6	12.6	40.2
Illiterate	47.4	87.4	59.8
Total	100.0	100.0	100.0
Respondents' radio listening habit			
Daily	25.3	9.7	20.5
Once in a week	6.1	1.9	4.8
Once in fortnight	2.0	0.5	1.5
Sometimes	29.9	27.1	29.0
Never	36.7	60.9	44.2
Total	100.0	100.0	100.0

In terms of land holdings (Table 2), a large percentage (33.1%) of female-headed households had 0.5 to 1 hectare. The women who reported having less than a half hectare of land accounted for 25.7% and those with more than one hectare were 38%. As expected, the number of landless households was very small at 3.5%. Land ownership rate becomes even more problematic and complicated when gender is factored in. Although the chi-square test in Table 2 indicates insignificant associations, the percentages indicate that female-headed households own much lesser land compared to male-headed households. For instance, about 15% male-headed and 7.1% female-headed households owned land size of 1-2 hectares; 11.3% of male-headed and only 4.1% female headed households owned land greater than 2 hectares. The chi square analysis also revealed a significant association between gender or household headship and livestock ownership (at $p = 0.05$) where the percentage of male-headed households owning 4-6 TLU is 12.6 compared to 3.5 for female-headed households. Similarly, those male-headed households with over 6 TLU, was 12.6 % compared to 5.3% for female-headed households.

With regards to the type of farming practices, more than 92 percent of study subjects were found to engage in mixed farming. Most of the householders used either full or partial agricultural extension package (at 43.3% and 46.2 % respectively). Those reporting non-use of the packages accounted for 10.5 percent of the households. As indicated in the chi-square analysis on Table 2, female-headed households have lesser access to these agricultural packages ($\chi^2 = 0.019$) as 31.6% of male- headed households were full package users compared to only 11.7% of the female-headed households.; 31.4% of male-headed households were partial package users compared to only 14.7% of female-headed households (see Table 2).

Table 2. Results of bi-variate analysis (chi- square test) for associations between household headship and selected wealth indicators (n = 665)

Name	Category	Headship (%)			Chi_square test (χ^2)
		Male headed	Female headed	Total	
Tropical Livestock Unit (TLU)	0-2 TLU	17.9	10.1	28.0	**0.05***
	2.1-4 TLU	25.7	12.3	38.0	
	4.1-6 TLU	12.6	3.5	16.1	
	Above 6 TLU	12.6	5.3	17.9	
	Total	68.9	31.1	100.0	
	Mean (SD)	4.13 (3.31)	3.54 (2.96)	3.95 (3,22)	
Wealth index	Poor	22.1	14.9	37.0	**0.000 *** **
	Medium	39.7	15.0	54.7	
	Rich	7.1	1.2	8.3	
	Total	68.9	31.1	100.0	
Land ownership	Landless	2.4	1.1	3.5	**0.857**
	Upto half hectare	17.6	8.1	25.7	
	Half to one hectare	22.3	10.8	33.1	
	One to two hectares	15.3	7.1	22.4	
	Above 2 hectares	11.3	4.1	15.3	
	Total	68.9	31.1	100.0	
Type of farming	Crop production	3.2	3.3	6.5	**0.031***
	Animal husbandry	.3	.2	.5	
	Mixed farming	64.8	27.5	92.3	
	Others	.6	.2	.8	
	Total	68.9	31.1	100.0	
Use of agricultural package	No package	5.9	4.7	10.5	**0.019***
	Full package	31.6	11.7	43.3	
	Partial package	31.4	14.7	46.2	
	Total	68.9	31.1	100.0	

Note. *Sig. at $p < 0.05$.

The overall production of the cultivated crops is reported to be quite small. Only maize cultivating respondents (around 72%) reported a production level of above 5 quintals. 28.9 percent produced less than 2.5 quintals of haricot bean, 23.6 percent (2.5 to 5 quintals) and 21.6 percent (above 5 quintals) of haricot bean (Table 3).

Table 3. Percentage distribution of respondents by annual average pulse production, consumption, marketed and purchased per year (n = 665)

Type of crops	Produced	Consumed	Sold	Purchased
	----------%----------			
Chickpea				
None	89.3			75.2
Up to 2.5 quintals	4.8	4.8	2.1	1.2
Above 2.5 quintals	5.9	5.6	3.3	23.6
Haricot bean				
None	30.1	-	-	80.5
up to 2.5 quintals	32.2	48.6	27.1	0.8
Above 2.5 quintals	37.7	17.6	29.0	18.8
Lentil				
None	98.6	-	-	43.6
up to 2.5 quintals	.2	.2	0	3.6
Above 2.5 quintals	1.2	0	0	52.8

Table 4 presents the percentage distribution of the men and women's participation at various stages of pulse agriculture, starting from land preparation to pulse based food preparation. More than 90 percent of men, compared to 6 percent of women, always participate in land preparation activities. Likewise, 87 percent of men and 13 percent of women usually participate in sowing. Harvesting is also reported to be the main duties of the men at 87.5%. Men are also the ones controlling the marketing of pulses. Women are reported to dominate only the processing and cooking of the pulse based foods at 78.9 and 88.7 percent respectively.

Table 4. Gender differentials of participation in pulse production (based on respondents' recall of recent harvesting year), n = 665

Type of activity	Never	Rarely	Sometimes	Always
	----------%----------			
Land preparation (men)	8.0	0.3	0.5	91.3
Land preparation (women)	42.1	23.9	28.0	6.0
Sowing (men)	10.4	0.2	2.4	87.1
Sowing(women)	40.8	20.9	25.3	13.1
Growing crops (men)	9.3	0.8	4.4	85.6
Growing crops (women)	29.3	19.8	34.3	16.5
Harvesting (men)	9.5	0.8	2.3	87.5
Harvesting(women)	48.1	24.5	18.9	8.4
Collection of production in the farm (men)	13.5	0.3	4.5	81.7
Collection of production in the farm(women)	17.3	22.1	38.6	22.0
Transporting production (men)	15.8	2.9	14.1	67.2
Transporting production (women)	16.2	19.8	32.3	31.6
Grinding/processing (men)	85.6	2.0	5.0	7.5
Grinding/processing (women)	12.5	2.1	6.6	78.8
Selling production (men)	14.3	1.7	5.1	78.9
Selling production (women)	25.1	16.1	27.4	31.4
Cooking pulse based food (men)	90.4	2.7	4.2	2.7
Cooking pulse based food (women)	5.4	0.9	5.0	88.7

4. Discussion

The analysis and the subsequent elaboration of the gender framework for pulse production are based on the ongoing collaborative project between Hawassa University (HwU) and the University of Saskatchewan (UofS) aimed at reducing protein-calorie malnutrition in Ethiopia by promoting the adoption of pulse technologies and nutrition interventions at household level, especially for young children and women.

As noted in the result section, the volume of production and consumption of pulse crops was generally very low in the study area. The findings from the quantitative and qualitative data revealed that haricot bean was the major pulse although chickpea can also be produced in the area without difficulties. Both male- and female-headed households cited confronted constraints associated with the low productivity of pulse. These included problems of selection of the right variety of pulses suitable for the soil, pest problems, high cost of artificial fertiliser (urea and DAP), lack of funds to purchase improved seeds (which often forced them to produce haricot bean without applying nitrogen fertiliser), and small land holding. Households also had certain preferences for producing one kind of pulse than others due to different motives. In general, there was consensus that women's preference for some varieties of pulses differed from that of men with the former usually preferring to produce crops which are mainly used for domestic consumption and the later opting for crop varieties that have high market demands and prices. A study conducted by Lemlem et al. (2011) in Hallaba, Dale and Ada Liben districts in Ethiopia indicated that where chick pea and haricot beans are considered to be priority commodities, men preferred to produce their improved varieties while women preferred the local variety (Dima) which is more suitable for household use.

The study'analysis has clearly highlighted the huge gender disparities and constraints in terms of achieving expected level of production and consumption of pulse crops. There was a consistent report from both the focus group discussants and household respondents concerning the limiting factors. The main constraints include significant gender gaps in education status, access to media (especially radio), ownership of livestock, wealth index, type of production, access and use of agricultural packages.

The gender disaggregated background characteristics of the respondents clearly indicates that majority of the population in the study area have less education and very poor access to both printed and non-printed media material. The study has also shown huge gaps in education and media access between the female and male headed households. The level of human capital available in a household (usually measured as the education of the head of household or the average education of working-age adults in the household) strongly correlates with measures such as agricultural productivity, household income and nutritional outcomes (FAO, 2011). Limited women's education and training have been a critical factors in limiting the opportunities for women to gain new technological knowledge, inputs and finance. The focus group discussions revealed that most women use different informal platforms to access information and know-how on innovations; these include community organizations, exchange labor groups and extended family networks.

Findings of the baseline study also revealed that female-headed households own much less land, livestock and other important strategic resources compared to male-headed households. While gender disparities in land holdings are apparent in all regions, it is more pronounced in sub-Saharan African averaging 15 percent with fewer than 5 percent in Mali to over 30 percent in countries such as Botswana, Cape Verde and Malawi (FAO, 2011). In Ethiopia, since 2005, a new Federal Rural Land Administration Proclamation was introduced to benefit female-headed households and individual married women in gaining control of land, yet, there is still a local level customary system of land distribution preventing women's land ownership rights in many parts of the study regions. Mintewab & Stein (2010) stated that the land certification program in Ethiopia was meant to reduce the inherent insecurity of land holdings associated with state ownership of land, thereby promoting better land management and investment, and better production decisions associated with an increased sense of ownership. In fact, plots owned by some female-headed households are significantly less productive due to a number of factors (Mintewab & Stien, 2010). For instance, some of the female-headed households engaged in transferring their land on temporary basis to others because they did not own oxen and labour to execute demanding agricultural activities. In addition, woman's lack of education and poor access to media (especially radio) might have contributed to their low control of this important resource.

Ownership of cattle (especially oxen) is usually considered very essential for effective farming practices and land management. Studies in some developing countries indicate that men are responsible for keeping and marketing large animals such as cattle, horses and camels, while women tend to control smaller animals, such as goats, sheep, pigs and poultry (FAO, 2009). One of the commonly cited reasons for poor usage of land by women is poor ownership of livestock (Frank, 1999). Since women own less oxen and other important livestock (such as goats and sheep) relative to men, they are often viewed as weak farmers, and consequently, receive

limited or no attention during land allocation and redistribution by the government (note: the Ethiopian Constitution declares that land belongs to the state) and limited extension advises on uses of agricultural input and technologies. Lack of oxen also forces women headed-households into share-cropping arrangements whereas, men in the community bring their labour and oxen for harvesting the lion share of the produce leaving the female-headed households with food insecurity. Previous studies conducted in the study areas indicated that female headed-households were more prone to food insecurity compared to male headed households mainly due to little access to land, livestock and other important household wealth (Mengistu et al., 2009; Nigatu & Assefach, 2006).

It was noted that more than half of the female-headed households used partial agricultural extension package or never used any, thereby impacting productivity and preferences on the types of agricultural activities households engaged in. In the context of the study area, new forms of technologies are integrated into extension packages (which usually include improved seed, varieties of inputs, family life education etc.) and are addressed by local extension agents. The home-based extension programs usually focus on hygiene, cooking techniques, family planning, childcare and the like) while the farm based extension programs focus on the use of fertilizer, selected seed, land management, pest control, etc. Most focus group discussants indicated that there are many circumstances where female headed-households were not well addressed in the course of their encounters.The issue of access to agricultural inputs and technologies is mainly related to the issue of whether or not women are perceived as farmers due to their limited access to land and oxen.

As in other parts of the country, women in the study areas carried out the lion share of the workload of the households. Women are not only the major sources of labour in the production sector, they are also responsible for numerous reproductive and community activities despite the fact that such loads are undervalued by the society. The focus group discussions revealed that women work for 12-16 hours per day with more than half of the time devoted to domestic work**.** As evident from the detailed description of gender disaggregated data on table 4, generally men are the key players in crop production (including pulse) and are the main beneficiaries from the sale of these crops. In contrast, there are very few activities in which women dominate. Men are typically responsible for the heavy manual tasks such as land preparation, tillage, seed selection etc. Women take active part in weeding, harvesting, cultivation, weeding, transplanting, raising seeds, food preparation which they bring to the field to feed husbands and other day to day management which all require attention, recognition and regularity.

5. The Gender Framework

Given the above mentioned gender related constraints, the project team developed a framework for improving the status of women, more particularly women-headed households' in terms of enhancing their knowledge, participation, access to and control over key household resources for improved production and consumption of pulse based foods.

While several frameworks exist, five major/commonly used frameworks are identified in literature; Harvard Analytical framework or gender roles framework, the Moser Gender planning framework, Gender analysis matrix, the women empowerment framework, and the social relation approach (Smyth, 1999). Each of these frameworks/approaches reflects a set of assumptions, indicators and issues to be addressed in order to achieve successful development and intervention outcomes, at different levels of analysis (individual, household, population, institutional levels etc.). The framework introduced in this paper bases itself partly on the empowerment framework which can be easily operationalised, and is context specific (i.e. specific to pulse agriculture). The development of the framework followed a three-step process to incorporate gender into the project: (1) Identifying the gender-related obstacles and opportunities (as identified in the gendered data analysis in result section above); (2) Identifying activities aimed at reducing the gender related obstacles identified based on feedbacks from focus group discussions and program objectives; (3) Introducing indicators/pillars for monitoring and evaluating plans to measure success of activities designed to bring about changes in gender-related constraints in pulse production and consumption.

The gender framework developed for addressing the findings of this study consists of four key pillars of intervention with the ultimate goal of increasing pulse productivity and enhancing nutrition security of household members. The four pillars are placed in the framework according to their sequence where meeting one would facilitate the successful achievements of the next pillar. The intervention domain ranges from improvement of skills and knowledge of men and women so as to contribute to policy-making through dialogue and policy briefs. Further, each intervention domain is backed by specific action programs activities derived from the findings of our baseline data analysis.

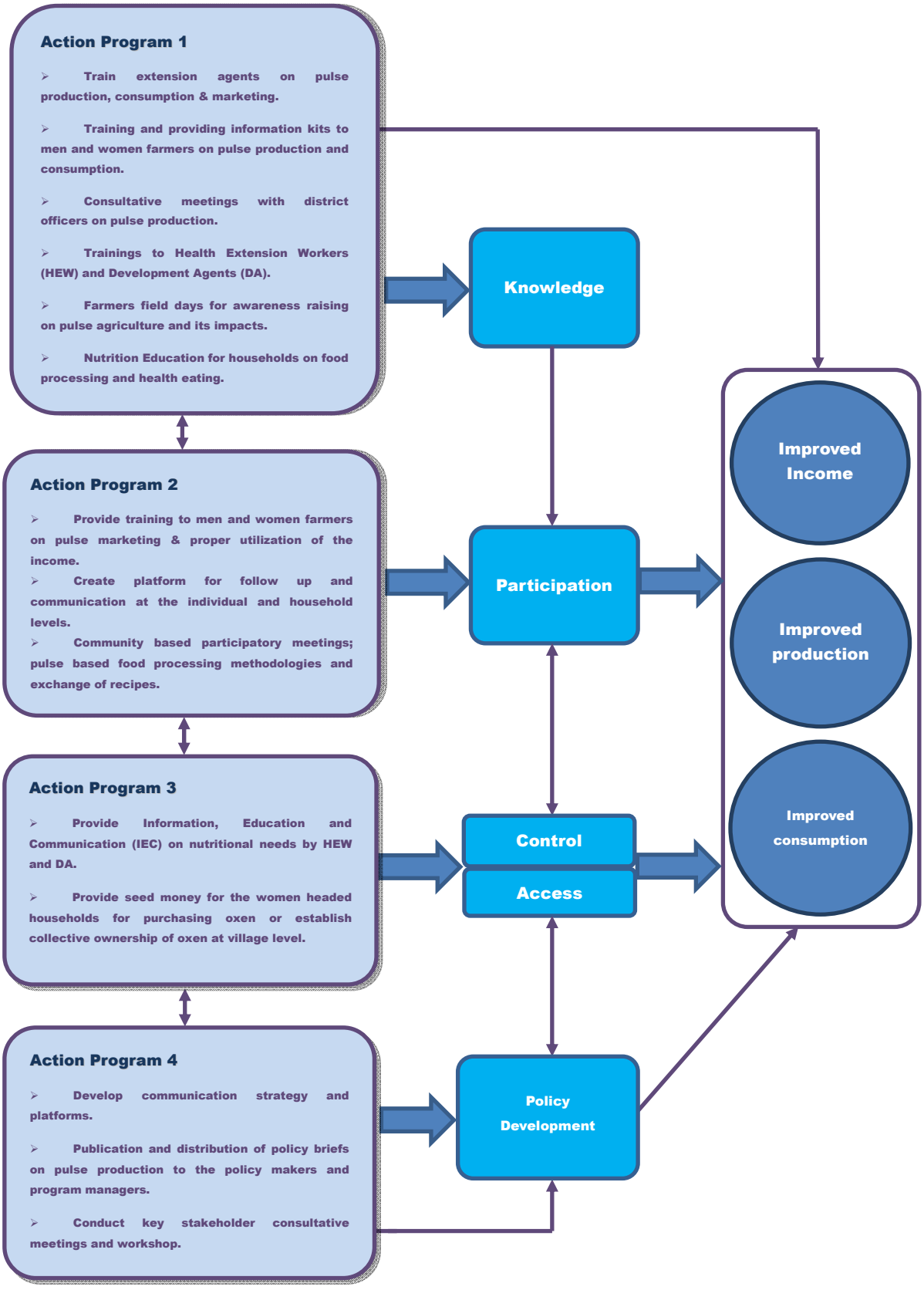

Figure 1. Gender Framework for improving pulse production and consumption

Knowledge acquisition entails building women's and men's productive and management capacities through skills training in the area of technology adoption for food processing, pulse marketing and improved use of income at household level. Specific training entails imparting knowledge to both women and men farmers who do not have the skills to apply chickpea and haricot bean technologies. Liaising with governments and officials to advocate for the training of more female extension workers in order to increase and improve extension services to women in female-headed households, women in male-headed households and members of community-based organisations/associations is also a dimension of knowledge acquisition.

Participation involves encouraging women's access to credit/capital that will increase their community self-help projects as well as their economic bases. Participation would also enhance women's voices in household decision-making because of increased support from group members. In addition, increased participation would improve women's access to harvested pulses through advocacy for the fair sharing of farm harvests before marketing. This would boost women's access to food for household consumption as well as provide opportunities for generating much needed income for the purchase of other household needs.

In terms of increasing access and control over resources, the implementation of the framework is expected to narrow down the gender differential in pulse production, consumption, marketing through increasing access to and control over land, information, technologies and income from sale of produce. Addressing women's empowerment requires a multifaceted approach that includes access to land, credit, extension services, training in agriculture and natural resource management, introduction to low cost technologies to ease the burden on women as well as non-agricultural income-generating activities (Dejene, 2003). Since women farmers are often burdened with their household chores and agricultural activities, alternative technologies such as de-husking and milling machines could be purchased that would simplify their work both on the farmland and in their household. Market opportunities would need to be sourced for men and women farmers and male farmers informed and trained to see the benefits of having their spouses work with them in managing farms. A number of researchers have shown that control over key resources… land, water, technologies, fertilisers, have positive effects on a number of important development outcomes including food security (Gete et al., 2015), and child nutrition and education (Hallman, 2000; Quisumbeng, 2003; Quisumbeng & Maluccio, 2003; Skoufia, 2005).

The fourth component of the framework is policy, which entails initiating programs that targets a good proportion of women farmers as beneficiaries and convince/educate policy makers, community leaders and small holder farmers of pulse values and benefits. This, of course, necessitates the creation of various communication platforms and messages transmitted and communicated in the local languages. Extension workers would also be mandated through policy to render equal services to both male and female farmers.

To sum up, the contribution of this operational gender framework developed and introduced in this study creates enabling environment for pulse agriculturists to become more gender-sensitive to respond to the growing concerns of hidden hunger and malnutrition among Ethiopian households. Experiences of the CIRFS project over the last few years witnessed that such framework is very simple, cost effective and effective in addressing the various gaps (including knowledge, participation, access and control of/over household resources and address policy gaps), and creates wider platform for actions. The framework can also be expanded to other contexts and regions relatively easily. Finally, it is worth mentioning that the effective application of the framework may be constrained by lack of data or poor use of data, technical and financial limitations and poor monitoring and evaluation of the performances.

6. Conclusion and Recommendations

Gender equality and empowerment are critical to sustainable development efforts in Ethiopia and in most developing countries. The findings of this paper's study revealed that female-headed households own much less land, livestock and other important strategic resources compared to male-headed households which in turn influence the level of their access, control and involvement in pulse production.

Based on the highlighted findings from the study, a strategic gender framework was developed to address the disadvantages faced by women in pulse production, consumption and marketing. The framework entails four actions plans for implementation aimed at addressing women' constraints in the areas of participation, knowledge, access and control of resources and cultural factor through policies, which the current collaborative project is to implement it during the course of time.

As a general recommendation based on this study, it is proposed that extension workers be sensitised to seek how best to reach women with information and services by increasing the number of female agents and availing market- oriented and high value inputs to meet the needs of women-headed households and women farmers in male-headed households. When implementing the gender framework described above, it is important to take into

consideration the married women in male-headed households in addition to those in female- headed households. During the course of intervention, it is also important to take into account existing gender differences in terms of accessing land, technologies and other strategic resources as highlighted. Finally, the limited technical and operational capacities of institutions (e.g. farmers training centers and extension workers) should be addressed by concerned government bodies along with conducting more pulse-agriculture-nutrition researches and partnerships.

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