Analysis of women empowerment in agricultural index: the case of Toke Kutaye District of Oromia, Ethiopia.

Lemlem Abebe, Dereje Kifle, Hugo De Groote

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Analysis of women empowerment in agricultural index: the case of Toke Kutaye District of Oromia, Ethiopia.

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Analysis of Women Empowerment in Agricultural Index: The Case of Toke Kutaye District Of Oromia, Ethiopia.

Abstract
This paper analyzes intra-household gender difference and women empowerment in agricultural index. A combination of multistage and random sampling technique was used. A total of 60 husbands and 60 wives were included in this study, selected from four kebeles proportional to
the number of beneficiaries in the kebele. Descriptive statistics, t-test, and women empowerment in agricultural index were used for analysis. There was disparity between women and men; women were less empowered than men. Women’s empowerment index in agriculture was 73%. Meanwhile, the overall gender parity index was 68% and the empowerment gap was 32%. Based on results obtained; the study suggests different areas of intervention that could bridge the gap and help for future improvement in reducing major contributors to the disempowerment of women in agricultural extension service and the level of women’s empowerment in agriculture.

Key Words: Gender Parity, Men, Participation, Women Empowerment in Agricultural Index, Women

1. Introduction

According to FAO (2010/11:40), women in some African countries spend up to 60 percent of their time on agricultural activities. Women farmers contribute up to 50 percent of labor on farms in sub-Saharan Africa. More than 60 percent of employed women in sub-Saharan Africa work in agriculture. Women play crucial roles as farmers and business women in smallholder agricultural production, as mothers managing household nutrition, and as innovators and educators. Improving the circumstances of women producers and raising their productivity are critical to agriculture-led growth in Sub-Saharan Africa. From the earlier, women operate at a distinct disadvantage in increasing their productivity and improving their market access. Several studies have documented how women have poor access to resources to respond to market signals.

In Ethiopia, rural women make significant contributions to agriculture and food security. They form the basis of the farm labor. Majority of women’s labor is invested in production activities like weeding, harvesting, household animal care, marketing, and post-harvest handling (Ranjan and Kedija, 2004). In addition to women’s active participation in agriculture and livestock production, mainly as a result of the gender-based division of labor, women are also responsible for most household tasks, like food preparation, fetching water, firewood collection, and child care. The intra-household inequality can weaken women’s position also outside of the home (Doss, 2011:20) therefore women in the male-headed households, are rarely considered as clients for agricultural research and development programs or users of improved technology, and thus technical training and extension programs are almost exclusively targeted at men. The nature and extent of men and women farmers’ role in small scale farming vary from region to region, culture to culture, even from crop to crop. Accordingly, women face different problems, and farming constraints. They desire technologies which can address these differences.

The Women’s Empowerment in Agriculture Index (WEAI) is a new survey-based index designed to measure the empowerment, agency, and inclusion of women in the agricultural sector. The WEAI was initially developed as a tool to reflect women’s empowerment. It comprises two sub indexes. The first reflects the percentage of women who are empowered in five domains of empowerment (5DE) in agriculture. Among women who are not fully
empowered, the index also reflects the percentage of indicators in which women enjoy adequate achievements. These five domains of the WEAI are decisions about agricultural production, access to and decision-making power about productive resources, control of use of income, leadership in the community, and time allocation. The second sub index: the Gender Parity Index (GPI) measures gender parity. It reflects the percentage of women who are empowered or whose empowerment score meets or exceeds that of the men in their households. For those households that have not achieved gender parity, it shows the empowerment gap that needs to be closed for women to reach the same level of empowerment as men (Alkire et al., 2013:1). Therefore this study was intended to assessing household power dynamics in crucial component of gender analysis.

1.1. Objective
The primary objective of the study was to assess women’s empowerment in agricultural index in the study area.
The second objective was to measure the contribution of the empowerment indicators to the disempowerment of women and men.

2. Methodology
2.1. Description of the study area
Tokke Kutaye is one of the Weredas in Oromia region, Ethiopia. It borders on the east by Ambo, on the north by Midakegn, on the west by Chaliya districts. According to the CSA population projection the total population of the Wereda as to July 2015 is estimated to 150,091, of which 74,464 were men and 75,627 were women; 15.63% of its population are urban dwellers (CSA, 2013:43). According to the information obtained from the agricultural office of the district, about 55.8%, 14.71% and 4.63% of land is cultivated land, grazing land and forest land, respectively. The remaining is used for different construction and other purposes (WoA, 2014). The Wereda is characterized by mixed farming system.
Figure 1 map of the study area

2.2. Sampling Technique and Size
Multistage sampling procedure was used to obtain the survey data. In the first stage Out of 31 kebeles in the Wereda; four kebeles were selected depending on access to all weather roads, the use of improved maize with the simple random sampling technique. In the second stage, a list of improved maize variety users’ in each kebele was obtained and listed from the Kebele office. The sample size of 120 respondents was determined by applying 90% confidence level based on Yamane’s approach (1967). The total sample size of 120 individuals (60 men and 60 women) was selected randomly from the total of 380 improved maize beneficiary households. Further, both man and woman in male-headed household were interviewed. To maintain representativeness, proportionate sampling was applied to kebeles.

\[ n = \frac{N}{1 + N(e)^2} \]

Where: \( n \) is the sample size, \( N \) is population size, and \( e \) is level of precision at 90% confidence interval

2.3. Method of Data Collection and Analysis
The study used primary and secondary data. The primary data were collected from sample households (both wife and husband in the household). Secondary data were collected from published and unpublished documents, reports, and records of DAs and agricultural and rural development officers of the district and Ambo Research Center. Primary data were collected with a semi-structured questionnaire and a checklist.
Descriptive statistics like mean, percentage and frequency was used for description. T-test and Cramer’s V was the used test statistics. Women empowerment in agricultural index was used to analyze women empowerment; the five dimension of empowerment with ten indicators was used and weighted according to their weight (Alkire et al., 2012:33) the 5DE contribute to the 90% of the measurement and gender parity index accounts for 10%. Overall, the final index is the sum the results of 5DE and GPI. According to (Alkire et al, 2012:33) to be empowered one has to achieve adequacy in more than 80% of the indicators. A cut off point for analysis is any combination of number between 0 and 100% following the international standard set by Alkire et al, 2012:33 cutoff point at 20% was used.

2.4. The 5DE Index
Following the (Alkire and Foster, 2011: 476) multidimensional poverty index, this sub-index assesses whether women are empowered across the five domains examined in the WEAI. For the women who are disempowered, it also shows the percentage of domains in which they meet the required threshold and thus experience sufficiency or adequacy. The 5DE sub-index captures women’s empowerment within their households.

Although the objective is a measure of empowerment, the construction of 5DE in such a way helps to analyze disempowerment. The advantage of this construction is that it allows us to identify the critical indicators that must be addressed to increase empowerment. This enables decision makers to focus on the situation of the disempowered. It starts by computing a disempowerment index across the five domains (M0); then compute 5DE as (1 – M0).

An inadequacy score is computed for each person, according to his or her inadequacies across all indicators. The inadequacy score of each person is calculated by summing the weighted inadequacies experienced so that the inadequacy score for each person lies between 0 and 1. The score increases as the number of inadequacies of the person increases and reaches its maximum of 1 when the person experiences inadequacy on all 10 indicators. A person who has no inadequacy on any indicator receives a c_i score equal to 0. Formally,

\[ C_i = w_1I_1 + w_2I_2 + \ldots + w_dI_d \]

Where \( I_i = 1 \) if the person has an inadequate achievement in indicator \( i \) and \( I_i = 0 \) otherwise, and \( w_i \) is the weight attached to indicator \( i \) with \( \sum_{i=1}^{d} w_i = 1 \)

Formally, the first component is called the disempowered headcount ratio (Hp): \[ Hp = \frac{q}{n} \]

Here \( q \) is the number of individuals who are disempowered and \( n \) is the total population.
The second component is called the intensity (or breadth) of disempowerment (Ap). It is the average inadequacy score of disempowered individuals and can be expressed as follows
\[ Ap = \frac{\sum_{i=1}^{n}Ci(k)}{q} \]

Where \( c_i(k) \) is the censored inadequacy score of individual \( i \) and \( q \) is the number of disempowered individuals.

\[ M_0 = H_p \times A_p \]

Finally, 5DE is obtained

\[ 5DE = 1 - M_0 \]

5DE is built based on \( M_0 \). It can also expressed as

\[ 5DE = H_e + H_p \times A_e \]

3. Result and Discussion

3.1. Descriptive Analysis of Variables

Results presented in Table 1 show the descriptive analysis of continuous variables for women. It is the comparative analysis that seeks to clarify the mean differences between the two study categories. Each of the significant variables is discussed in paragraphs. The difference in education was statistically significant for women. The mean education of respondents with access to agricultural extension service was greater than those who have no access. It is statistically significant at 5 % (\( p < 0.042 \)) probability level. This shows that level of education is associated with access to agricultural extension service. Illiteracy negatively affects women’s access to agricultural extension services.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Aggregate</th>
<th>Have access</th>
<th>Have no access</th>
<th>( t )</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>39.91</td>
<td>38.27</td>
<td>41.56</td>
<td>1.10</td>
<td>0.27</td>
</tr>
<tr>
<td>Education</td>
<td>2.02</td>
<td>2.75</td>
<td>1.29</td>
<td>2.07</td>
<td>0.042*</td>
</tr>
<tr>
<td>Dep. Ration</td>
<td>1.18</td>
<td>1.16</td>
<td>1.20</td>
<td>0.21</td>
<td>0.82</td>
</tr>
<tr>
<td>Family size</td>
<td>8.37</td>
<td>8.90</td>
<td>7.85</td>
<td>1.38</td>
<td>0.17</td>
</tr>
<tr>
<td>Farm experience</td>
<td>23.6</td>
<td>22.24</td>
<td>24.96</td>
<td>0.94</td>
<td>0.34</td>
</tr>
<tr>
<td>training freq.</td>
<td>0.419</td>
<td>0.69</td>
<td>0.148</td>
<td>1.94</td>
<td>0.056*</td>
</tr>
<tr>
<td>Farm distance</td>
<td>2.25</td>
<td>2.07</td>
<td>2.44</td>
<td>1.04</td>
<td>0.29</td>
</tr>
<tr>
<td>FTC distance</td>
<td>4.26</td>
<td>3.63</td>
<td>4.89</td>
<td>2.03</td>
<td>0.046*</td>
</tr>
<tr>
<td>Field day freq.</td>
<td>0.12</td>
<td>0.21</td>
<td>0.03</td>
<td>-1.58</td>
<td>0.11</td>
</tr>
<tr>
<td>Listening radio freq.</td>
<td>0.88</td>
<td>1.33</td>
<td>0.44</td>
<td>4.23</td>
<td>0.03*</td>
</tr>
</tbody>
</table>

Source: Own survey, 2015; *, significant at less than 5% probability level

The differences in frequency of participation in training, FTC distance from home and listening frequency to radio were statistically significant. Women farmers who had accessed agricultural
extension services were more frequent participants in agricultural extension service; they are nearer to FTC centre and are frequent listeners of radio than those women who had not accessed such services. The result is statistically significant at different probability level (Table 1).

Table 2 Distribution of Response of Different Variables by Access to Extension Service for Men

<table>
<thead>
<tr>
<th>Variables</th>
<th>Aggregate</th>
<th>Have access</th>
<th>Have no access</th>
<th>t</th>
<th>P- value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td></td>
<td>53.66</td>
<td>14.785</td>
<td>47.32</td>
<td>12.37</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>1.93</td>
<td>0.06**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td></td>
<td>4.75</td>
<td>3.835</td>
<td>6.5</td>
<td>4.12</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>3.55</td>
<td>0.10**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dep. Ration</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td></td>
<td>1.09</td>
<td>0.795</td>
<td>1.16</td>
<td>0.83</td>
<td>1.02</td>
</tr>
<tr>
<td></td>
<td>0.33</td>
<td>0.74</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family size</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td></td>
<td>8.13</td>
<td>3.22</td>
<td>8.51</td>
<td>2.94</td>
<td>7.75</td>
</tr>
<tr>
<td></td>
<td>0.499</td>
<td>0.16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farm experience</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td></td>
<td>33.55</td>
<td>13.995</td>
<td>28.35</td>
<td>12.52</td>
<td>38.75</td>
</tr>
<tr>
<td></td>
<td>1.58</td>
<td>0.11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>training freq.</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td></td>
<td>1.3</td>
<td>1.41</td>
<td>2.35</td>
<td>2.32</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>1.79</td>
<td>0.08**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farm distance</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td></td>
<td>1.87</td>
<td>1.205</td>
<td>2.24</td>
<td>1.41</td>
<td>1.50</td>
</tr>
<tr>
<td></td>
<td>1.02</td>
<td>0.30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FTC distance</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td></td>
<td>5.25</td>
<td>1.77</td>
<td>4.00</td>
<td>2.54</td>
<td>6.50</td>
</tr>
<tr>
<td></td>
<td>1.94</td>
<td>0.057**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field day freq.</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td></td>
<td>0.835</td>
<td>0.935</td>
<td>1.17</td>
<td>1.30</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>1.02</td>
<td>0.31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Listening radio freq.</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td></td>
<td>1.365</td>
<td>1.285</td>
<td>1.98</td>
<td>1.07</td>
<td>0.75</td>
</tr>
<tr>
<td></td>
<td>0.03*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Own survey, 2015. Note: *, ** significant at 5%, 10% probability level respectively.

Younger men had more access to agricultural extension services than their older counterparts. Farmers who did not access agricultural extension service were generally more aged. Mean education, frequency of participation in training, and frequency of listening to radio were higher for farmers who accessed agricultural extension service than those farmers who did not access. The result in Table 2 indicated that being younger in age and nearer to FTC made farmers had better access to agricultural extension service, advice, training and agricultural information.

3.2. WEAI for the Study Area

The WEAI for the study area is the result of weighted 5DE and GPI (Table 3). The value of 5DE (five dimensions of empowerment) was 0.736. The GPI (Gender Parity Index) result was 0.684. The WEAI, the weighted average of 5DE and GPI score is therefore, 0.731. This result is similar to the result obtained at Bangladesh, higher than the Guatemala, and less than the Result obtained on the pilot study result of Uganda, and Meskan District of Ethiopia (Alkire et al, 2012:37-41; Beyan, 2014:67). The 5DE result showed that 75 percent of women were disempowered. This also indicated that 25 percent of women were empowered. The inadequacy achievement of the disempowered women was 35.15 percent. This implies that the disempowered woman had inadequacy in 35% of the indicators or they had achieved adequacy in 65% of the 5DE indicators. Therefore, women’s disempowerment index which is the result of the product of disempowerment headcount ratio and average inadequacy score is 26% and the 5DE is (1-M0) which is 74%. The study result also revealed that 19.64 percent of the men were not yet empowered; their average inadequacy was 30.3%. This means that men’s had adequate achievement in 70% of the 5DE. The relative comparison of results between men and women
indicated that men had achieved empowerment in 79% while it was 25% for women. The
difference was approximately 54% in empowerment. Similarly, men achieved adequacy in 70
percent of dimensions of 5DE, while the 5DE was 65 percent for woman. Within the same
household difference in adequacy score for the 5DE of men and women was about 5 percent.

Table 3 Result of Women Empowerment in Agricultural Index of the Study Area

<table>
<thead>
<tr>
<th>Indexes</th>
<th>Condition of empowerment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disempowerment head count ratio (H)</td>
<td>men% (n=60)</td>
</tr>
<tr>
<td>Average inadequacy score (A)</td>
<td>30.30</td>
</tr>
<tr>
<td>Disempowerment index (M0)</td>
<td>5.95</td>
</tr>
<tr>
<td>5DE indexes (1-M0)</td>
<td>94.04</td>
</tr>
<tr>
<td>% of women with gender disparity (H_GPI)</td>
<td>100</td>
</tr>
<tr>
<td>Average empowerment gap I_GPI</td>
<td>31.57</td>
</tr>
<tr>
<td>GPI</td>
<td>68.42</td>
</tr>
<tr>
<td>No of wife used</td>
<td>60</td>
</tr>
<tr>
<td>Percentage of data used</td>
<td>100%</td>
</tr>
<tr>
<td>WEAI= (0.9(5DE)+0.1(GPI)</td>
<td>73.10</td>
</tr>
</tbody>
</table>

Source: Own survey, 2015

The GPI result revealed gender disparity in the intra-household. Among all the women in the
study, the average individual empowerment gap was 32%, which is large. The overall gender
parity index (GPI) equals to (1- [percent of woman who were less empowered (H_GPI) X
women’s individual average empowerment gap (I_GPI)]). In this case it was (1-[100%
x15.40%]) equating to 68%. This result is less than the Gender Parity index of Bangladesh,
Guatemala, and Uganda with GPI score greater than 80% in all places (Alkire et al, 2012:37-41).

3.3. Five Dimensions of Empowerment

The decomposed result of 5DE revealed that the domains that contributed most to women
disempowerment were inadequate work load (64%) and lack of adequate access to credit and
control over income obtained from credit (53%). More than 42% of the disempowered women
did not speak adequately in public area. It was 27% of the disempowered woman who lacked
adequacy in relative autonomy in production. It was also observed that lack of adequate group
membership and joint control over purchase, sale and transfer of resources contributed less to the
disempowerment of women. The study result also indicated that men’s deprivation in empowerment was the result of inadequate workload (16%) followed by lack of access to and decision on credit obtained (14%), and group membership (12.5 %). 5.4% of the disempowered
men lacked adequate leisure time and relative autonomy in production. Besides, both men and
women did not report disempowerment in input decision and resource ownership. Meanwhile,
disempowerment was not observed in income decision for men.
### Table 4: 5DE decomposed by dimension and indicator

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Productive (1/10)</th>
<th>Resources (1/15)</th>
<th>Income (1/5)</th>
<th>Leadership (1/10)</th>
<th>Time use (1/10)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Input dec.</td>
<td>Relative autonomy</td>
<td>Access to ownership</td>
<td>Purchase, sale &amp; decision on credit</td>
<td>Public speaking</td>
</tr>
<tr>
<td>Women Censored head count (CHC)</td>
<td>0</td>
<td>0.27</td>
<td>0</td>
<td>0.018</td>
<td>0.53</td>
</tr>
<tr>
<td>% contribution (_DAI20p)</td>
<td>0</td>
<td>0.10</td>
<td>0</td>
<td>0.005</td>
<td>0.14</td>
</tr>
<tr>
<td>Absolute Contribution (weight x CHC)</td>
<td>0</td>
<td>0.027</td>
<td>0</td>
<td>0.0012</td>
<td>0.036</td>
</tr>
<tr>
<td>% contribution by dimension</td>
<td>10</td>
<td>14.5</td>
<td>7</td>
<td>25.4</td>
<td>43</td>
</tr>
<tr>
<td>Men Censored head count</td>
<td>0</td>
<td>0.054</td>
<td>0</td>
<td>0.14</td>
<td>0</td>
</tr>
<tr>
<td>% contribution (_DAI20p)</td>
<td>0</td>
<td>0.09</td>
<td>0</td>
<td>0.44</td>
<td>0</td>
</tr>
<tr>
<td>Contribution</td>
<td>0</td>
<td>0.0625</td>
<td>0</td>
<td>0.02613</td>
<td>0</td>
</tr>
<tr>
<td>% contribution by dimension</td>
<td>9</td>
<td>44</td>
<td>0</td>
<td>27</td>
<td>48</td>
</tr>
</tbody>
</table>
3.4. Gender Difference and Feeling of Decision Making in Agriculture

The analysis result for gender difference in different aspect of agricultural decision making show that there is similar feeling for decision making in taking crops to market and livestock raising. There is difference observed in other aspects although the gap did not be large enough. The percent of woman who feel decision making over minor household expenditure is higher for woman. Moreover, most of men feel make decision on wage or salary employment obtained while the reverse is true for woman (Table 5).

<table>
<thead>
<tr>
<th>Aspects of decision making</th>
<th>Male % yes</th>
<th>Male % no</th>
<th>Female % yes</th>
<th>Female % no</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural production</td>
<td>98</td>
<td>2</td>
<td>93</td>
<td>7</td>
</tr>
<tr>
<td>Purchase of input for agricultural production</td>
<td>100</td>
<td>0</td>
<td>95</td>
<td>5</td>
</tr>
<tr>
<td>Types of crops to grow</td>
<td>100</td>
<td>0</td>
<td>92</td>
<td>8</td>
</tr>
<tr>
<td>Taking crops to market</td>
<td>98</td>
<td>2</td>
<td>95</td>
<td>5</td>
</tr>
<tr>
<td>Livestock raising</td>
<td>100</td>
<td>0</td>
<td>98</td>
<td>2</td>
</tr>
<tr>
<td>Wage or salary employment</td>
<td>92</td>
<td>8</td>
<td>3</td>
<td>97</td>
</tr>
<tr>
<td>Minor household expenditure</td>
<td>54</td>
<td>46</td>
<td>73</td>
<td>27</td>
</tr>
</tbody>
</table>

Source: own survey, 2015
Age was associated with empowerment of both sexes. Among the total empowered of women, 86% of them was found in the age category between 26 and 64. However, 14% of them were found in younger and older age categories. In reference to male, comparable result was observed for the age group 26-64 (Table 6). More than 84% men farmers were in the age group 26-64. This implies that the relative empowerment of productive age group in agriculture. However, the relationship was not significant for both female and male. With regards to education and empowerment, it was observed that among all respondents in the secondary cycle 50% of the empowered men completed of secondary cycle education. Meanwhile it was 11.7% for empowered women. The result in Table 6 indicated that 50% of empowered women also were illiterate. This may indicate that for women education had no relationship with empowerment. For men, 81% of the empowered men completed grade twelve as compared to 19% who, were found in illiteracy and higher level. Although there was association between education and empowerment, there was no significant relationship observed for both men and women. In fact, the relationship between education and empowerment was stronger with men than with women.

Table 6 correlation of age category by participation in extension

<table>
<thead>
<tr>
<th>age category</th>
<th>Empowerment</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Woman</td>
<td>Men</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>no</td>
<td>Yes</td>
<td>no</td>
</tr>
<tr>
<td>&lt;25</td>
<td>20</td>
<td>80</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>26-45</td>
<td>27.03</td>
<td>72.97</td>
<td>78.57</td>
<td>21.4</td>
</tr>
<tr>
<td>46-65</td>
<td>16.67</td>
<td>183.3</td>
<td>80</td>
<td>20.</td>
</tr>
<tr>
<td>&gt;66</td>
<td>50</td>
<td>50</td>
<td>85.7</td>
<td>14.3</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>75</td>
<td>80.36</td>
<td>19.6</td>
</tr>
<tr>
<td>Pearson chi2 (statistics and p value)</td>
<td>1.259</td>
<td>0.73</td>
<td>0.43</td>
<td>0.93</td>
</tr>
<tr>
<td>Crammer’s V</td>
<td>0.15</td>
<td>0.087</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fisher’s exact p value</td>
<td>0.73</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Education

<table>
<thead>
<tr>
<th>Education</th>
<th>Woman</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illiterate</td>
<td>24.14</td>
<td>75.8</td>
</tr>
<tr>
<td>First cycle(1-4)</td>
<td>21.4</td>
<td>78.6</td>
</tr>
<tr>
<td>Second cycle(5-8)</td>
<td>33.3</td>
<td>66.6</td>
</tr>
<tr>
<td>High school(9-12)</td>
<td>0(0)</td>
<td>100</td>
</tr>
<tr>
<td>Above 12</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>Pearson chi2 (statistics and p value)</td>
<td>0.885</td>
<td>0.82</td>
</tr>
<tr>
<td>Crammer’s V</td>
<td>0.125</td>
<td>0.28</td>
</tr>
<tr>
<td>Fisher’s exact p value</td>
<td>0.833</td>
<td>0.42</td>
</tr>
</tbody>
</table>

Frequency of agricultural extension service

| No contact | 14.8 | 85.2 | 83.3 | 16.7 |
| 1-3        | 36   | 64   | 85.7 | 14.3 |
| 4-6        | 25   | 75   | 79.17 | 20.8 |
| >6         | 0    | 0    | 60   | 40   |
Total 25 75 80.36 19.64
Pearson chi2 (statistics and p value) 3.10 0.21 1.75 0.63
Crammer’s V 0.235 0.176
Fisher’s exact p value 0.171 0.61
Source: Own survey, 2015

The relationship of empowerment and frequency of agricultural extension service showed that the Majority of the empowered female farmers received agricultural extension services for not more than three times with respect to less than 29 percent of the empowered women with no contact. Concerning the disempowered, more than half of the women responded that they had no contact with agricultural extension service. This result revealed that empowerment is associated with frequency of access to agricultural extension service. It is also observed that the empowered women shown less with no contact and the vice versa. Men empowerment and frequency of extension contact was also associated and it revealed that more than 82% of men were frequently contacting services for less than six times. Additionally, less than 7% of empowered male was contacting more than six times. 11% of the empowered men were not having contact with agricultural extension service. The result of crammers V indicates that the association of frequency of agricultural extension contact was stronger with women than men.

4. Conclusion and Recommendation
4.1. Conclusion
The descriptive and chi square analysis revealed that there were significant difference between men and women in the household in terms of frequency of extension contact, frequency of training participation, frequency of field day participation, frequency of involvement in demonstration and access to credit services. The results indicate that male farmers were more frequently beneficiaries than female farmers in the household.

WEAI score indicated that women farmers were empowered in 73% of the 5DE indicator. There existed gender disparity among men and women in the household in taking part in improved maize extension service. The average empowerment gap was 31.5% while the gender parity index was 68.4%. This indicates that gap in empowerment needs to be addressed. Among the 5DE, the contribution of each indicator to gender disempowerment was different for both women and men. Inadequate work load, lack of adequate access to credit and control over income obtained from credit, inadequate public speaking, and lack of relative autonomy in production contributed most to women’s disempowerment. Meanwhile, men’s deprivation in empowerment was the result of inadequate workload, lack of access to credit, lack of decision on credit obtained, lack of adequate group membership, inadequate leisure time and relative autonomy in production.
4.2. Recommendation

Women’s are only empowered 73% in agriculture. However, their rate of empowerment should be expected to be 100% as they are contributing much to agriculture. Therefore, greater effort is needed to empowering women in different aspects. There is a clear empowerment gap between men and women in their household. Future, projects in the study area, need to consider and address the level of the empowerment gap here determined so that women’s empowerment in agriculture is realized. The improvement of the contribution of each indicator to both men and women disempowerment according to their importance shall reduce disempowerment and facilitate adequate empowerment in all dimensions.

5. Reference


