Socio-Economic Factors Influencing Household Postharvest Cereal Loss In Wikililye Location Of Kitui County

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ABSTRACT

The study was conducted to elucidate the influence of socio-economic factors on household postharvest cereal loss in Wikililye location of Kitui County. This cross sectional study was conducted on 343 households, who were selected using population proportional to size sampling method. To collect quantitative data, a questionnaire was administered through face-to-face interviews. Key informants and focused group discussants were purposively sampled to collect qualitative data. Data were analyzed using descriptive statistics and was presented using tables and verbatim narrations. The results of the study revealed that a majority of households in Wikililye location experienced postharvest cereal loss. Based on the results, majority of the households (63%) were found to experience cereal loss while 37% did not. The results of the descriptive statistics indicated that gender, age, level of education, marketing of cereals and alternative source of income have an influence on household postharvest cereal loss. Female headed households; younger household heads below 39 years; household heads with secondary and tertiary and above education though very few; and household heads who did not market their cereals experienced reduced postharvest loss. Socio economic factors therefore influence household postharvest cereal loss. Educational level of most household heads was low and is therefore the recommendation of this study to provide trainings and avail the needed resources for households in order to equip in postharvest cereal loss prevention strategies. More studies also seem to be essential in order to provide practical solutions to reduce postharvest cereal loss and curb the severity of food insecurity in Wikililye location.

Key Words: Households, household postharvest cereal loss, socio-economic, Wikililye location

1. INTRODUCTION

An imperative development challenge is food security in food-deficit countries in sub-Saharan Africa (SSA) Mwaniki, (2006). Yet, a large volume of food, valued in excess of USD 4 billion (grain alone), is harvested each year Stathers, Lamboll, & Mvumi, (2013). The United Nations predicts that 1.3 billion tons of food produced is lost globally. This happens during postharvest operations every year in a world where over 870 million people go hungry Gustavsson, Cederberg, Sonesson, Van Otterdijk, & Meybeck, (2011). Food loss is a large and increasingly urgent problem and is particularly acute in developing countries where food loss reduces income by at least 15% for 470 million smallholder farmers. It also affect downstream value chain actors, most of whom are a part of the 1.2 billion people who are food insecure FAO/AFDB, (2009). According to Basavaraja, Mahajanashetti, & Udagatti, (2007) and Shah, (2013) in a World Bank report for India, it was estimated that 7%-10% of cereal loss took place during postharvest operation for the year 1999. The estimates further indicated that 12 to 16 million metric tons of cereals wasted each year could meet the food demand of about one-third of India’s poor population Nagpal & Kumar, (2012). In African countries, the losses have been
estimated to range between 20% and 40%, which is considerably significant considering the low agricultural activity in several regions of Africa Abass et al., (2014). Zorya et al., (2011) found that PHL of cereal in Southern and Eastern Africa account for over 40% of the total PHL in SSA countries. This represents losses of about $1.6 billion in value yearly. In Ethiopia a study by Dereje., (2000) shows that the magnitude of post harvest loss is tremendous ranging from 5% to 26% for different crops. In Uganda, APHLIS, (2012) indicated that post harvest losses of maize occur at an average of 17.58%, an annual volume loss of 215,243.13 metric tons. In Kenya, according to Cereal Growers Association 30-40% of the total cereal production in Kenya is lost due to post-harvest handling inefficiencies and these impacts negatively on farmer’s income, market supply, cereal prices and food security.

In Eastern Kenya, Kitui included studies done by Recha, Kinyangi, & Omondi, (2012), show that 50% of grain losses has been experienced in the past 3 years due to invasion by aflatoxin producing fungi that affect all types of grains produced. Despite the recorded continued postharvest cereal loss (PHL), which is an important and complementary factor to food security, hunger and malnutrition, it has not received the required attention. Available evidence indicates that over the years, only a small percentage of funding is allocated to research for post harvest cereal loss (M. Bourne, 1977; M. C. Bourne, 2017; Kitinoja, Saran, Roy, & Kader, 2011). However, there is now consensus that increasing food production in isolation, without addressing postharvest (PH) losses, is inadequate in addressing food insecurity, thus a renewed global interest to mitigate PH cereal losses is needed Abass et al., (2014). Kitui County also experience food shortages since adequate rainfall for crop production is a constant challenge (FAO, 2003; 2006) and any postharvest cereals loss worsen the situation Recha, Kinyangi, & Omondi, (2012). In Kitui studies conducted focused on training and demonstrations on postharvest technology transfer to reduce grain loss at farm level but did not considers social economic factors that influence postharvest cereal loss Mutambuki, Ngatia, & Mbugua, (2010). Social as well as economic factors strongly affect the nature and magnitude of cereal loss Development, (1978). Socio-economic characteristics have been reported to influence postharvest loss of cereals differently in different regions. However in Kitui and particularly Wikililye location which was the area of study, no such documented study has been carried out to determine the influence of socio-economic factors on post harvest loss of cereals.

2. RESEARCH OBJECTIVE

This study sought to analyze the socio-economic factors influencing household postharvest cereal loss in Wikililye location of Kitui County. It aimed to ascertain the influence of gender, age, education, marketing of cereals and alternative source of income on household postharvest cereal loss.

3. LITERATURE REVIEW

3.1 GENDER AND HOUSEHOLDS POSTHARVEST CEREAL LOSS
Grethe, Dembélé, & Duman, (2011) indicate that the factors contributing to post harvest cereal losses can be analyzed from the perspective of social and economic development. Gender is a social factor that has an effect on agriculture at large and influence post harvest cereal loss. The majority of the world’s agricultural producers are women: they produce more than 50% of the food that is grown worldwide. They are usually responsible for food processing and make a major contribution to food storage Bala, Haque, Hossain, & Majumdar, (2010). In Africa, women play a vital role in agricultural labor force and agricultural activities at large. They make up almost 50 percent of the labor force in sub-Saharan Africa. In southern Africa 40 percent of labor force and 50 percent in Eastern Africa is made of women Team & Doss, (2011). Specifically in Kenya women contribute to 75 percent according to studies carried out by Kimani-Murage et al., (2011).

Despite the central role women play in agricultural systems around the developing world, they face barriers in preventing post harvest cereal loss. They lack knowledge about cereal standards so their produce is discarded at market, they have limited access to tools for efficient post harvesting management or to a larger extent they are excluded from producer associations through which products can be sold Tielens & Candel, (2014). In addition, Kereth, Lyimo, Mbwana, Mongi, & Ruhembe, 2013; Rugumamu, (2012) also indicate that women contribute to cereal losses. This is because they lack adequate information on proper crop harvesting and handling techniques resulting in significant damage by insect pests during storage and marketing. Research into gender and diversity dimension of post harvest loss reduction is limited thus this study aims at adding to it.

3.2 INFLUENCE OF AGE ON POSTHARVEST CEREAL LOSS

Age of the household head has an influence on postharvest cereal loss. The influence of age on agricultural activities has been reviewed widely by various scholars. Many of them have differing views. Some studies found that age has no influence on agricultural activities such as the adoption to new technologies or decisions concerning management activities (Anim, 1999; Bekele & Drake, 2003; Thacher, Lee, & Schelhas, 1996; Zhang & Flick, 2001). However, others found that age is significantly and negatively related to farmers choice of agricultural activities for example the choice to adopt to new technologies aimed at improving post harvest management activities to reduce cereal loss (Anley, Bogale, & Haile-Gabriel, 2007; Dolisca, Carter, McDaniel, Shannon, & Jolly, 2006; Featherstone & Goodwin, 1993; Gould, Sauer, & Klemme, 1989; Lapar & Pandey, 1999; Mzoughi, 2011; Nyangena, 2008).

According to Matsumoto, Obara, & Luh, (1983) age is an important aspect in post harvest handling of maize as it influences agronomic practices adopted by the farmers. El-Osta & Morehart, 1999; Lapar & Pandey, (1999) reported that age is postulated to influence agricultural technologies positively or negatively in that the old are rigid in adopting new technology unlike the young. This makes the elderly more prone to postharvest cereal loss. In addition, studies by Savadogo, Reardon, & Pietola, (1998) have also found age to influence agricultural activities especially when it involves embracing new technologies which are meant to reduce loss of cereals.
and improve agriculture as a whole to deal with hunger and food insecurity. This is largely because the old tend to be more conservative and have the tendency to evade risks. It is postulated that they are reluctant to try out new technologies and innovations and tend to stick to the traditional ones which contribute much to the amount of postharvest cereal loss experienced. The young on the other hand are receptive to new ideas and are energetic and readily to adapt to modern methods of farming and technologies which encourage reduced postharvest loss of cereals. In Wikililye location, literature on the age of household head and their contribution to household postharvest cereal loss was unavailable and therefore necessitated the study.

3.3 LEVEL OF EDUCATION AND POST HARVEST CEREAL LOSS

The level of education is a social factor that has an influence on post harvest cereal loss. Ani, (2007) indicates that education is a continuous issue and a lifelong process. It is a powerful tool for shaping peoples life and making a meaningful life, even at an adult age. This is the reason there exist a positive correlation between education and human survival. Increasing agricultural productivity as well as reducing post harvest losses depends primarily on the education of the rural farmers to understand and accept the complex and scientific changes which according to Odia, (2017) are difficult for the illiterate rural farmer to understand. Different scholars have divergent views on the impact of education in relation to postharvest cereal loss. According to Najafi, (2003) the level of formal education of household members could lead to awareness of the possible merits of utilizing modern agricultural technology, which enables them to carry out activities that reduce post harvest loss of cereals. This is in line with El-Osta & Morehart, (1999) and Mann, Hendrickson, & Pandey, (2001) whose studies indicates that post harvest loss of cereals will either increase or decrease with a farmers level of education. According to them increased level of education will increase on adoption and adherence of the recommended improved scientific methods because it makes the farmer to make more informed decisions.

According to Kumar & Kalita, (2017) lack of knowledge contributes to a significant amount of cereal loss during the post harvest operations especially in developing countries where people try to make the best of the food produced. In Mato Grosso Brazil, a study by Martins, Goldsmith, & Moura, (2014) on the managerial factors affecting post harvest losses of cereals, education level did not influence the magnitude of losses although it was hypothesized that higher education level should lead to lower post harvest cereal loss. In Ghana a study done by Basavaraja, Mahajanashetti, & Udagatti, (2007) revealed that education level of farmers influence the post harvest loss of cereals significantly at the farm level. They further indicated that educating and training the farmers on post harvest activities would greatly help in reducing the post harvest cereal loss. However, in Wikililye location, information on influence of education on postharvest cereal loss is wanting and therefore unclear whether it has an influence on loss. This study therefore sought to establish the influence of education on household postharvest cereal loss.
3.4 ALTERNATIVE SOURCE OF INCOME AND HOUSEHOLD POSTHARVEST CEREAL LOSS

In numerous studies, a result that comes through is the strong positive relationship between income level and postharvest loss of cereals. Source and level of income plays a vital role in postharvest loss of food including cereals. This is evident globally as Parfitt, Barthel, & Macnaughton, (2010) outlines the factors leading to post harvest losses in developing countries. In these countries production is dominated by small scale farmers with limited or not existent access to financial resources. Production, harvest and post-harvest techniques and technology are often out-dated. In addition, technical, regulatory, and financial capacities are often inadequate. Buchner et al., (2012) indicate that postharvest cereal losses at the front end of the post-harvest supply chain were significantly higher in developing countries than in developed countries, and that the main reason was related to the fact that small-scale labor-intensive agricultural production in Africa is inefficient due to the limitation of capital, technology, and management.

In Nigeria according to a study by Mada, Hussaini, & Adamu, (2014) the main causes of grain postharvest losses and waste in low income countries are connected to financial management and technical limitation. Due to inability to purchase mechanized postharvest operation machines, post harvest losses are inevitable. In Tanzania ANSAF, (2016) noted that ability to have an alternative source of income, availability of labor beyond production as factors that influences the utilization of improved storage structures. In different agro-ecological zones of Kenya, a study by Affognon, Mutungi, Sanginga, & Borgemeister, (2015) indicated that farmers lack of economic incentives to store and better protect food contributed a lot to postharvest losses. In Wikilibye location, no study has been done to assess whether postharvest cereal loss is influenced by households’ alternative source of income and this necessitated the study.

3.5 MARKETING OF CEREALS AND HOUSEHOLD POSTHARVEST CEREAL LOSS

Marketing of cereals has been demonstrated as a factor influencing the rate of postharvest cereal loss. This occurs through a number of ways. According to Zorya et al., (2011) in Sub-Saharan Africa, there may be a greater absolute PHL during bumper harvests. This may be brought about by shortage of labor to care for the grain or lack of incentive since larger harvests are associated with a sharper fall in the market prices. In addition, low prices and surplus production may result in a slower flow to the market leading to longer storage periods on the farm contributing to more cereal losses. In East and southern African counties studies by (Kimenju, De Groote, & Hellin, 2009; Tefera et al., 2011) many smallholders sell their produce immediately after harvest because of lack of suitable storage structures for cereal storage and absence of storage management technology thus incurring loss.

In Kenya according to Mutungi & Affognon, (2013) majority of farmers face limited storage capacity hence are forced to sell their cereals especially maize in the early harvesting season when the prices are lower. Burke, (2014) in his study in Western Kenya found that farmers suffer the same fate. However, he added that apart
from selling during low prices due to poor storage systems, they also lack credit or savings and urgent need for cash to meet their immediate needs. On the contrary Komen, Mutoko, Wanyama, Rono, & Mose, (2006) in a study in North West Kenya, observed that some losses occur at farm level due to low prices and delayed payment by National Cereals and Produce Board as farmers tend to keep the maize. They also noted that farmers generally sell their output immediately after harvest to meet cash needs. Hodges, Bernard, Rembold, & others, (2014) reported physical loss of cereals caused by lack of opportunity as a result of producers inability to access markets or lower market value due to for example sub-standard grain and/or inadequate market information. The reviewed literature shows that marketing of cereals influence postharvest loss of cereals mainly when there is bumper harvest or when farmers have to sell their produce for economic needs. However in Wikililye Location the relationship between marketing of cereals and its influence on postharvest loss among small-scale farmers has not been determined nor documented. This study therefore sought to examine the influence of marketing of cereals on household postharvest cereal loss.

4. METHODOLOGY

The study was conducted in Wikililye location of Kitui County which has a total of 30villages. The study utilized cross-sectional descriptive research design. Data was collected from both primary and secondary data sources and individual households in Wikililye location constituted the unit of analysis. The total population in the location is 11,851 people and 3,149 households (KNBS, 2010). A sample of 343 households was obtained using population proportional to size (PPS) sampling technique. Primary data was collected through the use of a semi structured questionnaire, key informants and Focus Group discussions. The study generated qualitative data which was analyzed thematically and presented in form of verbatim narratives. Quantitative data generated was coded and analyzed using descriptive statistics namely frequencies, percentages and presented in tables. To generate Secondary data, literature was reviewed.

Wikililye location is inhabited by the majority Kamba people, with a few non-Kamba speakers. They mainly practice subsistence agriculture and self-employment like artisans, shopkeepers, and bodaboda operators. Others engage in petty trade such as selling in the market sheds.

5. RESULTS AND DISCUSSIONS

5.1 GENDER AND HOUSEHOLD POST HARVEST CEREAL LOSS

The findings of the study showed that (58%) of the respondents were females while (42%) were male. This is in consonance with the findings of ANSAF,(2016) in Dadoma and Manyara districts in Tanzania which findings indicated that (57.5%) of the respondents surveyed were female.
From descriptive analysis it is demonstrated that the household post harvest cereal loss was influenced by the gender of the household head. The findings indicated that majority of the households (41%) that did not experience postharvest cereal loss were female headed as compared to 31% of male headed households who reported no loss. This collaborates with Focus Group Discussions and Key Informant Interviews which demonstrated that the reason why male headed households experienced the most loss was due to their lack of availability to attend training forums on improved postharvest grain handling. In addition, they indicated that the trainings are normally offered in women groups which alienate men from attending and thus missing out on the postharvest cereal loss mitigation measures. These findings concur with a study of post harvest loss perceptions from nationwide living standards surveys in Malawi, Tanzania and Uganda by Kaminski & Christiaensen, (2014) who also found out that households headed by females experienced lower post harvest cereal losses.

According to Rogers, (2005) perspective in the diffusion theory, he states that there are many qualities in different people that cause them to accept or not to accept an innovation. In his five steps or stages to the process of adopting an innovation, the first stage is knowledge, in which an individual becomes aware of an innovation but has no information about it. This is the situation in Wikililye location where men lacks the knowledge and information thus experiencing increased post harvest cereal loss.

5.2 AGE OF HOUSEHOLD HEAD AND HOUSEHOLD POST HARVEST CEREAL LOSS

The age of the respondent household head was considered to be of importance as a factor influencing post harvest loss of cereals since it influenced farm activities and the likelihood of adoption of improved modern methods of post harvest losses control. Findings indicated that a majority of the households (36%) in the study area were 60years and above, followed by households within 40-59years (34%). The least number of respondents (30%) were below 39years old.

The age distribution shows that young people (age 39 and below) are lowest in percentage (30%) indicating that the young people venturing into farming is decreasing because of the migration of youths to urban settlements in search of white-collar jobs as narrated by FGD discussants. The result of the study concur with a study in Tanzania by ANSAF, (2016) who indicated that the lowest percentage (28%) of the sample in the study area were age 35 and below.

Results from descriptive analysis indicated that majority of respondents (59%) above 60years reported a high level of post harvest cereal loss. Households’ heads within age group 40-59years (48%) followed while households’ heads below 39years experienced the least post harvest cereal loss (40%). The lower percentage of post harvest cereal loss in the younger headed households was attributed to their ability to adapt to new changes. They were also able to purchase the best preventive measures since they were involved in other forms of income generating activities. Findings of this study are in consonance with studies by Savadogo et al., (1998) in Burkina
Faso who found that age influence agricultural activities especially when it involves embracing new technologies which are meant to reduce loss of cereals and improve agriculture as a whole to deal with hunger and food insecurity. The elderly were reported to be resistant to change especially modern agricultural technologies.

According to Rogers, (2005) theory of adoption to innovation all stages of adoption are influenced by age. Knowledge, persuasion, decision making, implementation and confirmation depend on the age of the adopter. The older people lack the modern knowledge; refuse to be persuaded about the advantages of embracing change and this influence the decision making on adoption. In Wikililye location, the trend of the old being resistant to change still exists. This had lead to increased post harvest cereal loss among the aged.

5.3 EDUCATION AND HOUSEHOLD POST HARVEST CEREAL LOSS

The level of education of the household head has the ability to influence and may hinder the acceptance of improved storage technologies such as metal silos and hermetic bags Okoedo-Okojie, Onemolease, (2009). Findings of the study observed that majority (64%) of the households heads had attained primary education followed by secondary education (19%). It was noted that few respondents (10%) had no formal education whatsoever while a small number (7%) had tertiary and above level of education. The results are in agreement with that of CIMMYT, (1993) where it was reported in Kenya that majority of farmers have primary school education and rely on traditional farming practices.

The results of descriptive analysis indicated that majority of the respondents that had attained secondary level of education and tertiary and above reported reduced post harvest losses of cereals compared to those with no education and those with primary level (72% and 50% respectively. The findings that respondents in the study area who had a higher level of education experienced reduced post harvest loss does not concur with studies by Ognakossan et al., (2016) in Kenya who found out that the magnitude of the total post harvest maize losses was not influenced by the level of education. The findings however, concur with a study of post harvest loss perceptions from nationwide living standards surveys in Malawi, Tanzania and Uganda by Kaminski & Christiaensen, (2014) who reported perceived lower magnitude of post harvest losses in households where the household head had a post primary education.

The study is supported by Rogers, (2005) diffusion theory. This is depicted in the first three stages which include knowledge, persuasion and decision making. Individuals with high level of education attainment are able to acquire knowledge from different sources for example radios, extension officers etc. they are also open to changes thus easy to persuade and are able to make informed decisions. Those with limited educational attainment are vice versa which influence the rate of post harvest cereal loss in the respective households.
5.4 ALTERNATIVE SOURCE OF INCOME

The respondents’ alternative sources of income were assessed in the study. The findings illustrate that the main source of income for the majority of the respondents (70%) was farming. Other respondents in addition to farming were involved in non-farm sources and formal employment and made up (30%) of the respondents. These sources included but not limited to casual labour, small businesses, bodaboda riders, construction among others. Agriculture was reported as the main source of income of the households. The finding is also comparable with that of County Government of Kitui, (2013) which stipulates that the majority of residents derive their incomes from farming, it is estimated that 87.3% of the population depends on farming.

The findings on descriptive statistics indicates that majority of the households (65%) obtaining alternative source of livelihood from formal employment and nonfarm activities experienced reduced cereal loss compared to those who solely depended on farming as a source of livelihood (67%). This was attributed to their ability to purchase better management strategies and ability to market their cereals when the prices are high since they are able to curb losses. This is consistent with the findings of ANSAF, (2016) in a study in Tanzania who noted that alternative income, labor availability beyond production as among the factors that facilitates the utilization of improved storage structures due to ability to purchase them and thus reduce post harvest loss.

5.5 MARKETING OF CEREALS AND HOUSEHOLD POSTHARVEST CEREAL LOSS

The study further sought to determine whether marketing of cereals influenced post harvest cereal loss. Findings indicates that majority of the respondents (63%) did not market their cereals. This was attributed to the small amount of production by majority of respondents since they are small scale farmers. This is supported by findings of a study by Recha, Kinyangi, & Omondi, (2013) in Kitui who reported that the average farm size among the households in Kitui including Wikiliyie is 2 hectares and the farmers practice mixed farming. However a small proportion of households (37%) did market their produce. The main reason cited for the selling of cereals was to meet basic economic needs. Majority of the farmers were further forced to sell immediately after harvest due to household needs and also in order to avoid loss arising from infestation by pests due to poor storage practices.

Results on the influence of marketing cereals on households post harvest cereal loss indicated that households that sold their produce reported higher percentage of post harvest loss (68%) than households that did not sell their produce (51%). From focus group discussion and key informant interview, it was revealed that many farmers sold their produce when the prices are low thus facing economic loss. The findings of this study corresponds to a closer margin to those of Abass et al., (2014) in Dadoma and Manyara of Central and Northern Tanzania which observed that three factors were the key reasons that compelled the farmers to sell their cereals soon after harvest. Majority sold their cereals (54%) due to household expenditure need, 38% was due to cash needs for school fees and perception of surplus produce above storage capability (8%). It further confirms the
observation of Stathers, Lamboll, & Mvumi, (2013) that farmers sell their cereal produce due to financial needs. However, the implication of early and immediate sale of cereals soon after harvest is that farmers miss the opportunity to increase their revenue from sale of their cereal produce resulting from high prices if they could have stored them for a longer period. Therefore, an effort to store the produce until when the market prices are much higher provides an important income opportunity to small holders and can possibly contribute to reduction of poverty and hunger.

The study is supported by Rogers, (2005) diffusion theory. This is depicted in the third stage of diffusion theory (decision making) where individuals have a right to made decisions irrespective of the implication the decision has on postharvest cereal loss. Households make decision to market their produce in order to meet household expenditure needs such as cash for school fees or even for leisure. This resultantly contributes to postharvest cereal loss because they sell immediately after harvest at throw away prices.

6. CONCLUSION

In conclusion, the study established that majority of households in Wikililye location experienced postharvest cereal loss. The study found that gender, age, level of education, alternative source of income and marketing of cereals influenced household postharvest cereal loss.

7. RECOMMENDATION

It is the recommendation of this study that the dormant storage facilities for the communal storage system be activated since they will go a long way in reducing postharvest loss. Further, there should be integration of men and women in training forums which will give equal opportunities for both genders to gain knowledge on effective postharvest loss mitigation practices.

8. REFERENCES


9. TABLES

**Table 1: Gender and Household Post Harvest Cereal Loss**

<table>
<thead>
<tr>
<th>Distribution by Gender</th>
<th>Frequency</th>
<th>Percent</th>
<th>Food Loss</th>
<th>No food loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>145</td>
<td>42</td>
<td>90</td>
<td>55</td>
</tr>
<tr>
<td>Female</td>
<td>198</td>
<td>58</td>
<td>125</td>
<td>87</td>
</tr>
<tr>
<td>Total</td>
<td>343</td>
<td>100</td>
<td>215</td>
<td>142</td>
</tr>
</tbody>
</table>

*Source: Field survey data (2017)*

**Table 2: Age and Household Post Harvest Cereal Loss**

<table>
<thead>
<tr>
<th>Distribution by age</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cereal Loss</th>
<th>No cereal loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 39</td>
<td>104</td>
<td>30</td>
<td>42</td>
<td>62</td>
</tr>
<tr>
<td>40-59</td>
<td>115</td>
<td>34</td>
<td>55</td>
<td>60</td>
</tr>
<tr>
<td>60 and above</td>
<td>124</td>
<td>36</td>
<td>73</td>
<td>51</td>
</tr>
<tr>
<td>Total</td>
<td>343</td>
<td>100</td>
<td>215</td>
<td>142</td>
</tr>
</tbody>
</table>

*Source: Field survey data (2017)*

**Table 3: Distribution of Respondents by level of Education**

<table>
<thead>
<tr>
<th>Distribution by level of education</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cereal Loss</th>
<th>No cereal loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>34</td>
<td>10</td>
<td>24</td>
<td>10</td>
</tr>
<tr>
<td>Primary</td>
<td>220</td>
<td>64</td>
<td>152</td>
<td>68</td>
</tr>
<tr>
<td>High school</td>
<td>64</td>
<td>19</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>Tertiary and above</td>
<td>25</td>
<td>7</td>
<td>7</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>343</td>
<td>100</td>
<td>215</td>
<td>142</td>
</tr>
</tbody>
</table>
Table 4: Influence of alternative source of income on household postharvest cereal loss

<table>
<thead>
<tr>
<th>Distribution by source of income</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cereal Loss</th>
<th>No cereal loss</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>%</td>
</tr>
<tr>
<td>Farming</td>
<td>343</td>
<td>70</td>
<td>229</td>
<td>67</td>
</tr>
<tr>
<td>Non-farm and formal sources</td>
<td>150</td>
<td>30</td>
<td>150</td>
<td>65</td>
</tr>
<tr>
<td>Total</td>
<td>343</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Field survey data (2017)

Table 5: Influence of marketing of cereals on household postharvest cereal loss

<table>
<thead>
<tr>
<th>Distribution by selling of cereals</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cereal Loss</th>
<th>No cereal loss</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>%</td>
</tr>
<tr>
<td>Sell</td>
<td>128</td>
<td>37</td>
<td>87</td>
<td>68</td>
</tr>
<tr>
<td>Don’t sell</td>
<td>215</td>
<td>63</td>
<td>128</td>
<td>59</td>
</tr>
<tr>
<td>Total</td>
<td>343</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Field survey data (2017)