Mbale District Report

Conducted and prepared for ICRAF BY

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Voices of Poor Livestock Keepers in the Lake Victoria Basin

VPLK Document 18

Africa 2000 Network - Uganda
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1.0 BACKGROUND

1.1 Overview of the Voices of the Poor Livestock Keepers in the Lake Victoria Basin Study

This study was sponsored by the U.K. Department for International Development as part of the Livestock Information Research Exchange in East Africa. The study was led by ICRAF and it focused on information and technology needs and sources for poor livestock keepers in the lake Victoria Basin.

The Uganda study was conducted in three Districts of which Mbale is one where Africa 2000 Network has worked for over 6 years and promoted livestock husbandry as a means to address poverty eradication. Mr. Fredrick Musisi Kabuye the Uganda Team Leader with a team of 6 others from Africa 2000 Network, Integrated Rural development Initiatives, Makerere University Business School and Development Consult and Advisory Associates carried out the study on behalf of Africa 2000 Network - Uganda.

1.2 Project objectives

- Identify where significant numbers of poor livestock keepers are located in the Lake Victoria Basin.
- Describe how those poor livestock keepers access new knowledge and technologies, with emphasis on livestock.
- Identify what the levels of demand for new livestock related knowledge and technologies are and to what extent these info needs are being met.
- Document which civil society organizations operate in the lake Victoria basin and to what extent they actually and potentially cater for the interest of poor livestock keepers.
- Suggest what ways civil society organizations can be empowered to enable poor people better access to new information and technologies.

13 Methodology

1.3.1 Study area

The survey covered Wanale sub county of Mbale district.

1.3.2 Research design

The study had two components, a qualitative survey using focus group discussion and an interview-administered questionnaire.

1.3.3 Population and sampling
Stratified sampling was employed at the district level based on the animal population of the sub counties. At the village a list of village members was obtained from the L.C chairperson, which was used to randomly select respondents for the questionnaire. It should be noted that sampling was purposive in the sense that selection was made for only those who were practising animal husbandry, agro forestry and horticulture.

13.4 Instrument development

A checklist of issues to be discussed during focus group discussion was generated. The baseline survey questionnaire was developed based on the specified objectives. A pre test of the instrument was done to test the suitability of the instrument. After the pre test, necessary changes were made in the instrument ready for the final survey.

1.3.5 Data entry and analysis

This involved questionnaire editing, coding, summarizing details, tabulation and statistical analysis. Coding of open-ended questions was also done. Data was captured using Epidemiological Information (EPINFO) software program with the help of variable data checks. Data entry screen and data check programs were designed and pre tested in advance to ensure that minimal errors were made during the entry process. After data entry, data cleaning to remove stray errors that might have occurred during the entry was done. Data was analysed using statistical package for social scientists (SPSS) version 10. Frequencies, measure of central tendency and cross tabulations were used for various variable.

2.0 Mbale District

2.1 Location and area size

Mbale district was formerly known as Bugisu district. The districts of Sironko in the north, Tororo in the southwest, Kumi in the northwest and the republic of Kenya in the east border it. Mbale district is on the area of 1,429.60 sq. km. The district has enormous tourism potential because of mount Elgon National park, which contains the beautiful Sipi falls

2.2 Relief climate and vegetation

The district lies at an altitude of between 1,299m and 4,321m above sea level, with a sub tropical type of climate. Temperatures are quite low and rainfall reaches up to 1,191mm per annum. Vegetation includes bamboo forests and some giant afro-alpine groundsels and lobelias on mount Elgon. The area under forest is 53,000 hectares

2.3 Population

Mbale district has a population of 745,696 people. The sex distribution of this population is 371,810 females and 373,885 males. The population per square kilometre is 5621.6???
2.4 Urbanization level

The two major towns in the District are Mbale, the administrative headquarters and Nakaloke. Mbale district constitutes of four counties; Bubulo, Bungokho, Manjiya and Mbale Municipality with a total of 19 sub-counties. The main language in the district is Lumasaba.

2.5 Economic activities

Agriculture is the major economic activity in the district. The major cash crops grown are coffee and cotton, while food crops grown vary from beans, maize, ground nuts, sweet potatoes, cassava, banana, rice etc. Vegetables grown are tomatoes, onions and cabbages. The animal population is 166,723 cattle, 169,755 goats 22,422 sheep and 23,049 pigs. As an agricultural district, industries in the districts are mainly agro-based; such industries include milk processing plants, coffee processing plants and cotton ginneries. Others include garments, pharmaceuticals and manufacture of exhaust pipes industries. Land ownership is largely based on the customary tenure system. Owing to land shortages agriculture is mainly practiced at subsistence level. Individual farms are too small to encourage high production for both the market and consumption.

2.6 Social services

The district has 330 primary schools, 58 secondary schools, 1 technical institution and 4 teacher-training colleges. The district has 2 hospitals; Buduba hospital with 104 beds and Mbale hospitals with 320 beds and 13 health centres.

3.0 Results and discussion

3.1 Coverage of the study

The survey was covered in Wanale sub-counties, Budwale parish with the distribution of respondents by village as shown in the table below.

<table>
<thead>
<tr>
<th>Village</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bukumi</td>
<td>13</td>
</tr>
<tr>
<td>Buwanyanga</td>
<td>15</td>
</tr>
</tbody>
</table>
3.2 Background of the respondents

3.2.1 Sex of the household head

Of the twenty-eight households visited, 23 (82.1%) were male headed while the rest (17.9%) were female-headed households. The smallest size household had 3 members, while the largest had 15 members with an average number of 8 members per household.

3.2.2 Age distribution of the household heads

The eldest household head was 62 years, while the youngest was 20 years old. The biggest percentage (51.4%) of the household heads was in the age bracket of 31 and 50 years, followed by those aged between 51 and 70 (36.2%).

3.2.3 Educational level of household members

Majority household heads had attended primary (38.2%) while (32.4%) had attended secondary education and no respondent had attended post-secondary. A relatively big proportion (29.4%) had not attained education at all.

Also 55.3% of the spouses had attended primary, 36.8% had not attended any level of education at all and the rest (7.9%) had attended secondary.

About 65.4% of the sons and 51.7% of the daughters of the households approached had attended primary, while 24.7% of the sons and 41.4% of the daughters had not gone to school at all. See bar graph below
3.2.4 Occupation of the household heads

The main occupation of the household heads is farming (93.8%) and the rest (6.3%) are formally employed. All the spouses (100%) engaged in farming.

3.2.5 Settlement and production on the farm

About 28.7% of the total households had recently (1990-1999) settled on their farms, while about 32.6% settled on their farms between 1980 and 1989. About 32.3% had settled in their farms between 1979 and earlier than that.

3.3 Crop production

3.3.1 Cash crop production

Cabbage emerged as the highly grown cash crop with 19.6%, followed by coffee (16.5%), carrots (13.4%), Irish potatoes (12.4%) and cowpeas (11.3%) respectively. The least grown cash crops were; ground nuts, yams, eggplant, cynrida and sukuma-wiki all with a percentage of 1%. The largest and the smallest acreage for cash crops were 12 acres and 0.25 acre respectively. The average size of acreage for cash crops was 0.9.

The majority respondents (67%) reported that they planted their cash crops as pure stand, while 31% used mixed cropping system. Furthermore about 19% of the respondents reported as having harvested over 10 bags/sacks of cash crops and 16.6% of the respondents said they harvested between 5 and 9 bags/sacks. The rest (64.4%) reported getting less than 5 bags/sacks of cash crops.

3.3.2 Food Production
Matoke bananas (20.5%) was the mostly grown food crop followed by yams (17.4%), cassava (15.2%), beans (15.2%) and maize (12.9%) respectively. The least grown food crops were; Sorghum, groundnuts, Soya beans, sweet bananas, pumpkin, cabbage and carrots all with 0.8%. The largest and smallest acreage for food crops was 4 acres and 0.12 acre respectively with an average acreage of 0.84 acre per food crop. Most respondents (87.2%) indicated that food crops were grown on less than two acres however the average size of acreage for food crops was about 1. Pure stand cropping system (66.4%) was mostly practiced for food crop production; the rest (33.6%) used mixed cropping. About 16.7% of the respondents harvested between 5 and 9 bags/sacks, while about 28% of the respondents harvested more than 10 bags/sacks and the rest (55.3%) got less than 5 bags/sacks during the last harvest.

3.4 Land resources

3.4.1 Plot characteristics and attributes

3.4.1.1 Soil type

The majority (47.6%) of the respondents interviewed indicated that their plots had loam soil, followed by plots with sandy loam (25%), Clay loam (16.7%), clay soil (7.1%) and Sandy (3.6%) respectively. See bar graph below.

<table>
<thead>
<tr>
<th>Soil type</th>
<th>Response distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandy</td>
<td>3.6%</td>
</tr>
<tr>
<td>Sandy loam</td>
<td>25%</td>
</tr>
<tr>
<td>Loam</td>
<td>47.6%</td>
</tr>
<tr>
<td>Clay loam</td>
<td>16.7%</td>
</tr>
<tr>
<td>Clay soil</td>
<td>7.1%</td>
</tr>
</tbody>
</table>

3.4.1.2 Plot quality ranking in relation to other plots around

Majority respondents (60%) ranked their plots as being average in quality relative to other plots in similar locations on the landscape. About 18.8% of respondent ranked their plots as being better than average around their area while 7.1% indicated that their plots were the best around the area. See table below.

<table>
<thead>
<tr>
<th>Quality of soil fertility</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best</td>
<td>7.1</td>
</tr>
<tr>
<td>Better than average</td>
<td>18.8</td>
</tr>
<tr>
<td>Average</td>
<td>60.0</td>
</tr>
</tbody>
</table>
3.4.1.3 Soil fertility

Most respondents (45.3%) reported that their soils were of average fertility, followed by poor soil fertility (24.4%) and good soil fertility (17.4%) respectively. Only 5.8% of the respondents indicated that their soils were of very good fertility, while 7% reported that their soils were of very poor fertility. However about 53.3% of those who reported their soil to be of good fertility had loam soil; also all those who said their soil was of very good fertility had loam soil. See table below.

<table>
<thead>
<tr>
<th>Soil fertility</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very good</td>
<td>5.8</td>
</tr>
<tr>
<td>Good</td>
<td>17.4</td>
</tr>
<tr>
<td>Average</td>
<td>45.3</td>
</tr>
<tr>
<td>Poor</td>
<td>24.4</td>
</tr>
<tr>
<td>Very poor</td>
<td>7.0</td>
</tr>
</tbody>
</table>

3.4.1.4 Change in soil fertility over the last 10 years or since acquiring the plot

Majority of the respondents (62.8%) also indicated that soil fertility had gotten worse over the last 10 years, followed by those who reported that their plots had not changed (17.4%) and 16.3% reported that their soil had gotten better on the fertility levels of their land. See table below.

<table>
<thead>
<tr>
<th>Change in soil fertility</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gotten much better</td>
<td>2.3</td>
</tr>
<tr>
<td>Gotten much worse</td>
<td>1.2</td>
</tr>
<tr>
<td>Gotten better</td>
<td>16.3</td>
</tr>
<tr>
<td>No change</td>
<td>17.4</td>
</tr>
<tr>
<td>Gotten worst</td>
<td>62.8</td>
</tr>
</tbody>
</table>

3.4.1.5 Major reason for observed change in soil fertility

The major reason for the observed change in soil fertility over the last three years reported by the respondents were manure application (34.4%), poor agricultural practices (26.2%), lack of fertilizer application and soil erosion (11.5%) respectively. See table below.

<table>
<thead>
<tr>
<th>Major reason for observed change in soil fertility</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor agriculture practices</td>
<td>26.2</td>
</tr>
<tr>
<td>Lack of fertilizer application</td>
<td>11.5</td>
</tr>
<tr>
<td>Soil erosion</td>
<td>11.5</td>
</tr>
</tbody>
</table>
plenty of legumes | 4.9  
Manure application | 34.4  
Mulching | 1.6  
Sood fanning/agriculture parasites | 4.9  
Others | 4.9

3.4.2 Access to land (land tenure)

3.4.2.1 Year when land was acquired

About 28.8% of the households reported as having acquired land between 1990 and 1999 followed by those who acquired land between 1980 and 1989 (25%), 1970 - 1979 (20%) and 2000 - 2002 (12.5%), while the least number of households (5%) acquired land earlier than 1960. See figure below.

<table>
<thead>
<tr>
<th>Year when land was acquired</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earlier than 1960</td>
<td>5.0</td>
</tr>
<tr>
<td>1960-1969</td>
<td>8.8</td>
</tr>
<tr>
<td>1970-1979</td>
<td>20.0</td>
</tr>
<tr>
<td>1980-1989</td>
<td>25.0</td>
</tr>
<tr>
<td>1990-1999</td>
<td>28.8</td>
</tr>
<tr>
<td>2000 - 2002</td>
<td>12.5</td>
</tr>
</tbody>
</table>

3.4.2.2 Land acquisition

Most respondents (42.5%) reported to have acquired their plots of land from relatives, while 41.3%) had purchased the land. However about 82% of the purchased land and 85% of the land got from relatives was formally a crop field.

<table>
<thead>
<tr>
<th>Plot was acquired</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchased</td>
<td>41.3</td>
</tr>
<tr>
<td>Rented</td>
<td>8.8</td>
</tr>
<tr>
<td>Given by relatives</td>
<td>42.5</td>
</tr>
<tr>
<td>Exchanged</td>
<td>5.0</td>
</tr>
<tr>
<td>Other</td>
<td>2.5</td>
</tr>
</tbody>
</table>

3.4.2.3 Possession of land title deed

Majority of the respondents (88.6%) had no land title deed, while 11.1% had title deed for their plots. See pie chart below.
3.4.2.4 Land use before acquisition

The majority of the respondents (82.3%) reported that their plots of land were used as crop fields before the households acquired it, while 16.5% of the total respondents reported that their plots of land were bush/forest before acquisition and 1.3% of the total respondents reported that the land was grazing enclosure before acquisition. Almost all (99%) the respondents indicated that their land is now mainly used for cultivation.

<table>
<thead>
<tr>
<th>Land use before acquisition</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop field</td>
<td>82.3</td>
</tr>
<tr>
<td>Grazing enclosure</td>
<td>1.3</td>
</tr>
<tr>
<td>Bush/forest</td>
<td>16.5</td>
</tr>
</tbody>
</table>

3.4.2.5 Reason for land acquisition

The major reason as to why most respondents acquired land was for farming (72.6%) followed by establishments/settlement (19.2%). While 8.2% of the respondents acquired land for some other reason. See table below

<table>
<thead>
<tr>
<th>Reason for acquisition</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farming</td>
<td>72.6</td>
</tr>
<tr>
<td>Pasture establishment/settlement</td>
<td>19.2</td>
</tr>
<tr>
<td>Others</td>
<td>8.2</td>
</tr>
</tbody>
</table>

3.4.4 Where animals are grazed

The majority of the respondents (53.6%) zero grazed their animals, about (43%) grazed their animals on their own land and the rest (3.6%) had some other means of grazing their animals.
3.4.3 Rights over land

3.4.3.1 Rights to sell land

While about 56.8% of the respondents who owned plots could sell them only after consultation with family members, 24.2% could sell their plots completely under their own discretion. The other remaining percentage (18.9%) could only sell their plots under circumstances.

3.4.3.2 Rights to renting out land

The majority of respondents (54.3%) reported that they could rent out their land after consulting their family members, followed by those who can rent land only under circumstances, those who sell land completely under their own discretion (21.3%). The rest (2.1%) reported that they could only rent out their land after consulting with the village leaders.

3.4.3.3 Rights to share crop

About (48.9%) of the respondents said sharecropping is done completely under their own discretion; while 41% sharecropping is done after consulting the family members, while the rest (10%) said they sharecropping is done only under circumstances.

3.4.3.4 Rights to giving out land

Majority of the respondents (45.3%) give out land but after consulting the family members, 32.6% give out land completely under their own discretion and about 21.1% give out land only under circumstances. The rest (1.1%) give out land after consulting with village leaders.

3.4.3.5 Rights to exchange land

Forty two percent (42%) of the total respondents do not exchange land but do so after consulting family members. About 34% exchange land completely under their own discretion, 22% exchange land only under circumstances and the rest (2%) exchange land after consulting with the village leaders.

3.4.3.6 Rights to choice of crops on land
Majority respondents (53%) have crop choice on land but consult family members. The rest (47%) have choice completely under their own discretion.

3.4.3.7 Rights to fallow land

About 44% of the respondents can fallow land completely under their own discretion, 27.4% fallow land after consulting family members and 28.4% can fallow their land only under circumstances.

3.4.3.8 Rights to plant Trees

About 45.3% of the respondents plant trees after consulting family members, followed by those who plant trees completely under their own discretion (48.4%) and 4.2% plant trees under circumstances. The rest (2.1%) plant trees after consulting with the village leaders.

3.5 Income sources

About 70% of the total respondents reported that their household members had informal/formal sources of income during the period 1st January 2001 to 31st December 2001.

3.5.1.1 Informal activities

Most household members, who had informal sources of income, got it through farming (65.5%), trading (17.4%) and shop keeping (13%). The least percentage (4.2%) of respondents reported as having got their income through jua kali.

The members with informal sources of income worked for a minimum of 4 hours a day and a maximum of 19 hours a day while the average time worked was 9.5 hours.

The average amount earned by members with informal sources of income was 117400/- per month with the maximum and minimum amounts earned per month being 1800000/- and 2000/- respectively.

3.5.1.2 Formal activities

Respondents reported that members in their households were teachers (66.7%) and nurse/medical officer (33.3%).
Members with formal sources of income worked for a maximum of 12 hours a day while the average time worked for was 12 hours.

The average amount earned by members with formal sources of income was 210000/- per month while the maximum and minimum amounts earned per month were 300,000/- and 30,000/- respectively.

33.2 Income from other sources

Most of respondents got income from remittance from relatives with a maximum amount of 150,000/- and a minimum of 5,000/- each time it is got, with an average of 42000/-. Remittance from relatives was received between 1 and 5 times. The total amount received in form of remittance from relatives was in the range of 300000/- and 5000/- with an average total of 88000/- per year.

The second recorded source of income was interest on savings with a maximum and minimum amount of 200,000/- and 100,000/- respectively. However, on average remittances from relatives was 150000/-. Among those who received interest on savings, some raise up to a total of maximum of 100,000/- with a total minimum of 80,000/=per year with an average of 90000/- per year.

3.5.3 Main source of income

The greatest percentage of respondents (92.9%) reported that sale of farm produce was their main source of income. Further more, about 92.9% ranked farming as the first main source of income during last year. About 72.7% of the respondents ranked Petty trade as the second main source of income.

3.6 Cash use in farming

3.6.1 Expenditure on farm inputs

Most of the farm inputs were bought as shown by the percentage distribution of the method of acquisition below.

<table>
<thead>
<tr>
<th>Farm inputs</th>
<th>Percentage representation of Method of acquisition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seeds</td>
<td>Bought (%) Loaned (%) Free of charge (%) Borrowed (%)</td>
</tr>
<tr>
<td></td>
<td>100       0             0             0</td>
</tr>
</tbody>
</table>

14
### 3.6.2 Cash expenditure in farming

Most households spent on farming cash crops, food crops and livestock production in all the three years (1999 - 2001). Among the respondents interviewed nobody spent money on bee keeping between 1999 and 2001.

The highest average amount of cash used in farming cash crops (138920/-) was realized in the year 2000 with a maximum and a minimum of 1500,000/- and 2,000/- respectively followed by an average amount of 76333/- realized in farming cash crops in 2001 with a maximum and minimum amount of 200,000/- and 2000/- respectively.

### 3.6.3 Income realized from farm produce

Most respondents indicated as having realized income from food crops, followed by cash crops and livestock production between 1999 and 2001.

The highest average income (122080/-) was realized from cash crop production in the year 1999 with a maximum and minimum of 500,000/- and 20,000/- respectively in that year, followed by an average income of 115666/- realized from horticultural production in the year 1999 with maximum and minimum income in that year being 350,000/- and 10,000/- respectively. However, nobody realized any income from bee keeping between 1999 and 2001.

### 3.6.4 Labour constraint

A total of about 90% respondents reported as having had labour in land preparation between 1999 and 2001. Despite the labour constraint in these years, most respondents reported that family members (85.2%) and hired labour (14.8%) was the main sources of

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<table>
<thead>
<tr>
<th>Item</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panga</td>
<td>96.4</td>
<td>0</td>
<td>3.6</td>
<td>0</td>
</tr>
<tr>
<td>Axe</td>
<td>81</td>
<td>0</td>
<td>14.3</td>
<td>4.8</td>
</tr>
<tr>
<td>Garden fork</td>
<td>80</td>
<td>0</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Watering can</td>
<td>36.4</td>
<td>0</td>
<td>0</td>
<td>63.6</td>
</tr>
<tr>
<td>Hoe</td>
<td>95.8</td>
<td>0</td>
<td>4.2</td>
<td>0</td>
</tr>
<tr>
<td>Slasher</td>
<td>37.5</td>
<td>0</td>
<td>0</td>
<td>62.5</td>
</tr>
<tr>
<td>Wheel barrow</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Pesticide</td>
<td>96</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Fertilizer</td>
<td>92.3</td>
<td>0</td>
<td>3.8</td>
<td>0</td>
</tr>
<tr>
<td>Sprayer</td>
<td>17.4</td>
<td>4.3</td>
<td>0</td>
<td>78.3</td>
</tr>
<tr>
<td>Ox-plough</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Animal feeds</td>
<td>52.6</td>
<td>0</td>
<td>0</td>
<td>47.4</td>
</tr>
</tbody>
</table>
labour for land preparation in all these years. The second most reported activity to have labour constraint between 1999 and 2001 was planting, livestock production and weeding (92% of the total respondents). Also, family members (85.2%) and hired labour (14.8%) were the sources of labour for planting and weeding between 1999 and 2001.

The least percentage of respondents realized labour constraint in establishing and maintaining trees.

3.6.5 Failure of implementation due to labour shortage

Majority of respondents (82.1%) agreed that there were some enterprises/technologies, which were not implemented, due to a labour shortage. While the rest (17.9%) said there wasn't any enterprise/technology, which was not implemented due to labour shortage.

3.6.5.1 Enterprises that failed due to shortage of labour

Most respondents (32%) reported that maize and sweet potato planting wasn't possible because of labour shortage; followed by cassava planting (20%). See table below.

<table>
<thead>
<tr>
<th>Enterprises not carried out</th>
<th>Percentage response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize</td>
<td>32</td>
</tr>
<tr>
<td>Millet</td>
<td>12</td>
</tr>
<tr>
<td>Cassava</td>
<td>20</td>
</tr>
<tr>
<td>Sweet potatoes</td>
<td>32</td>
</tr>
<tr>
<td>Cotton</td>
<td>4</td>
</tr>
</tbody>
</table>

3.7 Credit

3.7.1.1 Credit reception

Most households 60% did not receive any credit during the last three years. The rest (40%) had received credit.

3.7.1.2 Training before going for credit

Seventy four percent (74%) of the total respondents reported not to have received any information or training on how to use the credit before getting it. The rest (26%) received information or training on how to use the loan. See pie chart below.
3.7.1.3 Kind of training received before credit was given

Most respondents indicated that sustainable agriculture and business management were the major training components they mostly received.

3.8 Marketing

3.8.1 Products sold
The major sold farm produce/livestock products are Irish potatoes (57.9%), coffee (26.3%) and matoke bananas (16%).

3.8.2 Place where farm produce/livestock products are taken to sell
Most of the respondents sold their produce from the farm gate (50%) or market (42.9%) and schools (3.6%). About 17.9% of the respondents reported that they travel at least One kilometre to sell their produce, 17.8% of the respondents travel more than 10 kilometres and the rest (64.3%) travel between 2 and 10 kilometres to market. Also 53% of the respondents said they sell produce beyond the above-specified area.

3.8.3 Marketing problems faced
The marketing problems recorded by the respondents varied from low production (33.3%), lack of market for the produces (33.3%) and low prices (33.3%). See pie chart below.
3.8.4 Difficulties in marketing farm produce

Most respondents (92.6%) had difficulty in marketing produce from their farm enterprises while the rest (7.4%) had no difficulties.

3.8.4.1 Farm enterprises facing marketing problems

Below is a table showing farm enterprises that faced marketing problems.

<table>
<thead>
<tr>
<th>Enterprise facing marketing problems</th>
<th>Percentage response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize</td>
<td>5.3</td>
</tr>
<tr>
<td>Beans</td>
<td>5.3</td>
</tr>
<tr>
<td>Matoke bananas</td>
<td>10.5</td>
</tr>
<tr>
<td>Coffee</td>
<td>21.1</td>
</tr>
<tr>
<td>Sweet potatoes</td>
<td>5.3</td>
</tr>
<tr>
<td>Irish potatoes</td>
<td>58.8</td>
</tr>
</tbody>
</table>

3.8.5 Need for marketing information

Knowledge about the prevailing prices (34.5%) and Market identification (27.6%) is the information mostly sought by the respondents in order to ease marketing of their farm produce. See bar graph below.
3.8.6 Kind of roads in the village

Eighty one percent (81%) reported that the type of roads which pass through their villages are feeder roads, while 14.3% reported foot roads and 4.8% reported main roads.

See bar chart below.
3.9 Information and technology adoption

3.9.1 Livestock

3.9.1.1 Possession of different livestock species

Among those who had zebu cow species, each one of them had an average of 4 animals with a maximum and minimum of 35 animals and 1 animal respectively.

Zebu bulls more than three years old while have an average of about 2 bulls with a maximum and minimum of 4 bulls and 1 bull respectively.

In addition, the zebu heifers and bull calves between the age of one month and three years in an average range of 1 - 2. No respondent had cross and Ankole cattle of any size.

Among those who had female and male sheep, each household had an average of about 2 sheep with a maximum and minimum of 2 and 1 respectively.

Those who either had goats for either local, dairy or meat species had an average range of about 1 - 5 goats with a maximum and minimum range of 1 - 8 goats.

Other male and female livestock had an average of 3.4 per household with a maximum and minimum of 14 and 1 respectively.

3.9.2 Importance of livestock

About 97% of the respondents indicated that the importance of livestock to them home consumption food and source of income. Also 53% out of total respondents indicated that livestock is important as a source of manure, social cultural functions (35%), security (18%), drought power (38%) and status (23%).

Livestock as a source of income was ranked first by about 58% of the respondents, followed by livestock as a source of food was ranked second by about 54% of the respondents and source of manure came third with about 45% respondents.

3.9.3 Person consulted about change in livestock farming

The respondents reported that when they want to change the practice in livestock farming they mostly consult veterinary officers (51.5%) and fellow farmers (24%). Also about
15% of the respondents reported that they do not have anybody to consult. The least source to be consulted was reported to be extension staff (9%). See bar graph below

![Bar graph showing percentage distribution of person consulted for change in farming practice](image)

### 3.9.4 Information sought about livestock

The major information sought from the above sources was reported to be mostly disease diagnosis (32.5%), followed by pest and disease control (25%), animal feeding (25%) and Artificial insemination (A.I) (10%). The least information sought is information on housing (7.5%). About 64.3% of the respondents reported that they got information they wanted, while 35.7% reported not to have got it from the above sources.

See bar chart below
3.9.5 Accessibility of veterinary services

About 62.5% of the respondents reported to have access to veterinary services while the rest (37.5%) reported not to have accessibility to veterinary services. See pie chart below.

3.9.6 Kind of veterinary information Accessed

Most respondents (45.8%) reported that they access information about pests and diseases control, followed by the treatment of animals (41.7%) and feeding (8.3%). The least information accessed is housing (4.2%). See bar graph below.
3.9.7 Type of fodder given to animals

The respondents reported that they mostly cut for their cattle Napier (50%), followed by banana stems (12.5%), maize Stover (12.5%) and kikuyu (12.5%). The least cut fodder for cattle was Tanzanian (6.3%). See bar graph below.

3.9.8 Information needed about fodder

About 33.3% of the respondents reported that they mostly want to know information concerning fodder management, while 29.6% reported they want to know about fodder use by type in milk production and 25.9% want to know about fodder establishment. The least kind of information needed about fodder for increased livestock production is pasture storage (3.7%). See bar graph below.
3.9.9 Months when fodder is bought

The respondents who normally buy fodder reported that they buy fodder during January (29.2%) and February (29.2%), followed by December (12.5%). The least percentage of respondents bought fodder during April (4.2%). No respondent reported to have bought fodder during the months of May, July, August, September and November. See graph below.

3.9.10 Place where the animal is kept

Majority respondents indicated kept their cattle outside (55.2%) while 41.4% and 3.4% said they keep their cattle in a kraal and house respectively. See bar graph below.
3.9.11 Use of bedding for cattle

Majority of the respondents (96.3%) do not use bedding for their cattle while only 3.7% reported to use them.

Those who reported as not having used bedding for their cattle did so because it's not necessary for animals (41.7%) and the rest 58.2% was because of ignorance.

3.10 Cattle dung management

3.10.1 Cattle dung usage

Cattle dung is mostly used for making composite manure (54.5%) or is scattered in the gardens (18.2%). The least percentage of respondents reported that they use it for smearing baskets/houses (3%). See bar graph below.
3.10.2 Source of knowledge about cattle dung management

Most respondents got to know about cattle dung management from either their fellow farmers (56.3%) or NGOs/CBOs (25%). The rest (18.8%) got to know about it from extension workers.

3.10.3 Quality of farmyard manure

Most respondents (70.4%) are not satisfied with the quality of farmyard manure while 29.6% reported that they were satisfied. The respondents reported that they mostly need information about farmyard preparation (44.4%), application (38.9%) and management (16.7%).

3.11 Horticulture

3.11.1 Horticultural Crops grown in 2001

The most grown horticultural crops in the respondents' farms in 2001 were jackfruits (11.2%), cabbages (9.6%), passion fruits (9.6%) and tomatoes (8.8%). The least grown crops included lemons (0.4%), pumpkin (0.4%) and vanilla (0.4%).

The most important purpose or use of these crops was for food (74.4%) followed by income (24.4%), the least purpose was shade (0.4%).

3.11.2 Horticultural crops grown in 2000

The most grown horticultural crops in the respondents' farms in 2000 were jackfruits (12%), cabbage (10.3%), tomatoes (9%) and passion fruits (8.1%). The least grown crops included lemons (0.4%), pumpkin (0.4%).

The mostly reported purpose or use of these crops was for food (73.7%) followed by income (24.6%); the least purpose was medicine (0.9%) and shade (0.9%).

3.11.3 Horticultural crops grown in 1999

The mostly grown horticultural crops in the respondents' farms in 1999 were jackfruits (12.6%), mangoes (12.1%), passion fruits (10.7%) cabbage (9.8%) and avocado (8.4%) respectively. The least grown crop was cynrida (0.5%)
The mostly reported purpose or use of these crops was for food (76.8%) followed by income (22.4%); the least purpose was medicine (0.4%).

3.11.4 Horticultural crops introduced in the last three years

Most respondents reported that the following were the horticultural crops introduced in the last three years: - jackfruit (13.5%), passion fruit (10.8%), avocado (9.5%), Pineapples (8%), Yams (8%), Tomatoes (8%) and Cabbages (8%) respectively. The least reported horticultural crops grown during the last three years were; Onions and Amarathus red all with a percentage response of 1.4%.

3.11.5 Source of horticultural crops planted during the last three years

The respondents also reported that the agency or source of crops was mainly the market (49%); followed by fellow farmers (30%), while the least source reported was NGOs (3%). See bar graph below

3.11.6 Interest in growing other horticultural crops

The greatest percentage (89%) of the respondents said that they have interest in growing other horticultural crops, while the rest (11.3%) said they have no interest.

Of those who had the interest in growing other horticultural crops, 41.7% indicated that they have interest in growing pineapples followed, by cabbages (33.3%). Other crops listed include garlic (8.3%), onions (8.3%), and vanilla (8.3%).
The information needed about the crops mostly included: - their management (pest and disease control) (37.8%), followed by source of seeds/planting materials (24.4%), establishment (21.3%) and varieties available on market (16.5%) respectively.

3.12 Community based natural resource management (NRM)

3.12.1 Source of information on natural resource management

The information on natural resource management (agro-forestry, soil and water conservation, spring protection, soil fertility) is mostly got from fellow farmers (28.4%) followed by extension workers (24%), Media (Radio) (16%), NGOs/CBOs (9%) and agricultural officers (9%). The least reported sources are forest officers (1.1%) and local councils (1.1%). See bar graph below

3.12.2 Technologies learnt through extension agencies

The greatest percentage (95%) of respondents reported that they had learnt crop production through extension agencies over the last three years; the mostly specified area of crop production was Banana production. Other technologies, which respondents learnt included: - Soil improvement (49%), soil conservation measures (47%), Tree establishment/intervention (40%), Land preparation and planting (32%) and livestock production (32%). It is important to note that concerning livestock production most respondents specified that they mostly learnt pests and disease control, artificial insemination and cattle dung management.

3.12.3 Technologies being practiced through extension agencies
The greatest percentage (94%) of respondents reported that they had been practicing crop production through extension agencies over the last three years; the mostly specified area of crop production being practiced was Banana production. Other technologies, which the respondents are practicing included: Soil improvement (46%), soil conservation measures (43%), Tree establishment/intervention (31%) and Land preparation and planting (30%). The least practice recorded was farm planning and record keeping (8%).

3.12.4 Technologies familiar with before extension influence

The greatest percentage (92%) of respondents indicated that they were familiar with crop production before extension influence over the last three years, followed by livestock production (91%). The mostly specified area of livestock production was pests and disease control. Other technologies that the respondents were familiar with included; tree establishment/intervention (30%), Land preparation and planting (30%), Soil improvement (28%), Harvesting and storage (26%) respectively.

3.12.5 Tree management

3.12.5.1 Types of trees on the farms

The following were most kind of trees recorded by the respondents; Jack fruit (10%), Mango (9%), Eucalyptus (7%), Avocado (6%), Acacia (5%) and Papaw (5%). Seventy seven percent (77%) of these trees were planted while 23% were naturally grown. Forty five percent (45%) of the respondents indicated that trees on their farms were scattered all over the farm, followed by intercropped with crops (32%). The least percentage of responses (7%) indicated woodlot type of configuration. See figure below.
3.12.5.2 Uses of trees on the farm

The greatest percentage of respondents reported that they used trees on their farms as a source of food (42%), followed by source of firewood (18%), for building (15%). See figure below.

![Bar graph showing uses of trees on the farm](image)

3.12.5.3 Information asked about tree management.

Most respondents (60%) reported that they don’t find out more about the species of trees they plant in their farms while the rest (40%) find out about the tree species.

Those who find out about the tree species they plant in their farms mostly ask about tree management (45.7%), varieties available 45.7% and grafting (8.7%). The source of this information in most cases was forest officers (34.1%), agricultural officers (19.5%), and extension workers (19.5%). The least persons approached were the local councils (2.2%) and the sub county chiefs (2.4%). See bar graph below.

![Bar graph showing information asked about tree management](image)
The following information is not provided so far: - varieties available (36.4%) various uses of tree species (21.8%), nursery establishment and management (16.4%). The least was grafting (7.3%). See bar graph below.

3.12.5.4 Sources of tree seedlings

The sources of tree seedlings reported mostly were: - within the farm (39.5%), fellow farmers (34.2%) and market (15.8%) while the least sources were local council (1.3%), sub county (1.3%) and forestry department (1.3%). See graph below.

3.12.5.5 Production estimates and income from on farm nursery

The respondents reported the following tree species to be found on the nursery of their farms: eucalyptus (27.3%), musamba (18.2%) and jack fruits (18.2%). See graph below.
3.12.5.6 Quantities of trees produced in the last three years.

The qualities produced in 1999 ranged between 0-100 trees (80%) and between 100 and 500 trees (20%).

The quantities produced in 2000 ranging between 0 and 100 trees were (87.5%) and 101-500 trees were 12.5%.

3.12.5.7 Tree seedlings planted out

The number of seedlings planted out in 2001 was in range of 50-100 trees with an average of 77.5 trees, while in 2000 the tree seedlings planted out were in the range of 200-600 with an average of 400 tree seedlings and 1999 the average was 200 tree seedlings.

The income obtained from the sale of tree seedlings for the years 1999-2001 was the range of 30000/- - 140000/-

3.12 Investment in the land

The table below shows kind of practice respondents mostly paid for or would have paid during the last one year (2001) in order to improve their land.

<table>
<thead>
<tr>
<th>Practice/Improvements</th>
<th>% Expenditure</th>
<th>Minimum paid (U.Sh)</th>
<th>Maximum paid (U.Sh)</th>
<th>Average amount paid (U.Sh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hired labour</td>
<td>19</td>
<td>2,000</td>
<td>250,000</td>
<td>62,650</td>
</tr>
<tr>
<td>Inorganic fertilizers</td>
<td>6</td>
<td>5,000</td>
<td>45,000</td>
<td>21,833</td>
</tr>
<tr>
<td>Seeds/Seedlings</td>
<td>18</td>
<td>2,000</td>
<td>250,000</td>
<td>30,406</td>
</tr>
<tr>
<td>Pesticides/fungicides</td>
<td>13</td>
<td>1,200</td>
<td>120,000</td>
<td>18,756</td>
</tr>
<tr>
<td>Manure</td>
<td>1</td>
<td>4,000</td>
<td>20,000</td>
<td>12,000</td>
</tr>
</tbody>
</table>
### 3.12.1 SOIL AND WATER CONSERVATION

#### 3.12.1.1 Fallowing land

Fifty percent (51%) of the total respondents reported to be practicing fallowing. The main reasons for not practicing fallowing the land were lack of enough land (92.5%) and lack of knowledge (7.5%).

Those who leave their land to fallow mostly used the natural type of fallow (82.5%) while the rest (17.5%) used improved type of fallow.

The crops grown in the field in case the type of fallow is improved include canavaria (28.6%), crotalaria (14.3%) and calliandra (14.3%).

#### 3.12.1.2 Reasons for fallowing land

Seventy five percent (75%) of the respondents reported that the reason as to why they leave their land to fallow was to restore soil fertility, followed by drop in crop yields (8.3%), Can not prepare the land (lack of labour and cash) (6.7%) and lack of seeds to plant respectively. See graph below.

---

<table>
<thead>
<tr>
<th>Farm Implements/tools</th>
<th>15</th>
<th>2,500</th>
<th>80,000</th>
<th>14,826</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeds</td>
<td>5</td>
<td>5,000</td>
<td>90,000</td>
<td>34,143</td>
</tr>
<tr>
<td>Soil &amp; water</td>
<td>3</td>
<td>3,000</td>
<td>130,000</td>
<td>27,889</td>
</tr>
<tr>
<td>conservation structures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Livestock</td>
<td>17</td>
<td>2,000</td>
<td>380,000</td>
<td>76,772</td>
</tr>
<tr>
<td>Purchased land</td>
<td>2</td>
<td>15,000</td>
<td>665,000</td>
<td>240,000</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>2,000</td>
<td>40,000</td>
<td>17,333</td>
</tr>
</tbody>
</table>
3.12.1.3 Length of the fallow

Most respondents reported that they fallow their land for a period of two years (36.2%) fallowed by one year (27.7%). The least duration reported was one and a half years (4.3%). See graph below.

3.12.1.4 Problems with land fallowing

61% of the total respondents reported that they had problems with leaving their land to fallow.
The problems faced in the course of land fallowing include; uncontrolled bush burning (51.6%), followed by labour constraints to open the land again (22.6%). See graph below.

However the information needed in order address the above problems include more agricultural training (59.4%), loan accessibility (34.4%) and growing of legumes in a farm (6.3%).

3.12.1.5 Comparison of yields between 5-10 years ago and current yields.

The majority of the respondents reported that the current yields are less (78.4%) than the yields 5-10 years ago. While 15.9% of respondents said the current yields are more than yields 5-10 years ago and the rest 5.7% reported that it was still the same. See pie chart below.

3.12.1.6 Causes for change in yield

The causes of the above variations in yields were exhaustion of soil nutrients (33.8%), soil erosion (21.3%), over cultivation (20%), poor farming practices (17.5%) and change of weather (7.5%) respectively. See graph below.
In addition, most respondents (87%) also reported similar problems are prevailing on their neighbour's farms.

3.12.1.7 Soil erosion problems

The majority (93%) of the total respondents reported soil erosion as a problem on their respective farms.

Those who reported soil erosion existence on their respective farms, face mainly rill erosion (36%), crop roots exposed (36%) and crops washed away (22.5%). See graph below.

Fifty percent (50%) of the total respondents agree that conservation activities have increased agricultural production in their area. Also 23.3% strongly agree and 14% were undecided. Those who disagree were 10.5% while those who strongly disagree were 2.3%.

The biggest percentages of respondents (42.7%) agree that the way conservation activities are organized in their area motivates the community action group.
However, 21.3% were undecided, 21.3% disagree and 7.9% strongly disagree. Only 6.7% of the respondents strongly agree that organization conservation activities motivate the community action group.

The greatest percentage (47.7%) of the respondents strongly agrees that community members are always wishing to listen to advice from field worker/officer regarding soil and water conservation. Also 39.5% agree, 15.8% disagree, 4.7% were undecided and 2.3% strongly disagree.

About 37.3% of the respondents disagree with the statement that community members consider land degradation as over exaggerated; while 20.5% agree with the statement and 17% of the respondents strongly agree, 17% were undecided. Only 8.4% strongly disagree.

The majority of the respondents (41%) agree with the statement that community members wish to take remedial action but constrained by age, health, and personal circumstances. About 24% strongly agree with the statement, 10% are undecided, 14% disagree and 10.3% strongly disagree.

Fifty eight percent of the respondents strongly agree with the statement that community members recognize need for attention to soil productivity. Also 37.5% agree with the statement while 2.3% were undecided and 2.3% disagree.

About 51.2% of the respondents agree with the statement that community members wish to take remedial action but available solutions are too costly; 18.6% strongly agree, 15.1% undecided. Those who disagree with the statement were 12.8% and 2.3% strongly disagree.

The highest percentage of respondents 44.7% agree with the statement that community members wish to take remedial action but have insufficient information to make decisions. Also 37.6% strongly agree with the statement 9.4% are undecided, 5.9% disagree while 2.4% strongly disagree.

Most respondents (43.5%) strongly agree with the statement that community members wish to take remedial action but availability is the constraint. In addition, 42.4% agree with the statement while 7.1% were undecided. 4.7% disagreed and 2.4% strongly disagreed.
3.13 Collective action for natural resource management

3.13.1 Involvement in a group

Forty-four (44%) of the total households had an adult (or adults) belonging to a group (project) or cooperative during the past 5 years. The rest (56%) had no member belonging to a group or cooperative.

Of those who belonged to group or cooperative, 91% reported their group/cooperative still existed, while 9% reported their group no longer existed by the time of our visit.

3.13.2 Number of members in a group

Most groups where the household members belonged to had the number of members ranging between 1-25 members (42.5%) and 26-50 members (42.5%). See the graph above.

3.13.3 Distance travelled to usual meeting/working place

Sixty four percent (64%) of group members had to travel at least 1 kilometre to usual meeting/working place. The least number of respondents (2.1%) reported walking a distance of 10 kilometres while 6% worked 20 kilometres.

3.13.4 Groups and natural resource management

29.6% of the total respondents belonged to groups that address issues of natural resource management (soil, water, land, forests, etc) while 70.4% were not members. See pie chart below.
3.13.5 Group formation

Of the total groups that existed, 76% were formed through community's own initiative, 8% of the groups were formed through government influence, 8% through NGO/CBO influence and 4% through peer group pressure. See graph below.

3.13.6 Group affiliation

32.7% of the total respondents reported their groups as being affiliated to a larger/organization/federation.

Those groups affiliated to bigger organizations benefited from the affiliation in form of agricultural training (67%), financial accessibility (22%) and market accessibility (11.1%).

3.13.7 Membership to Natural Resource Management group

The majority respondents (97.6%) reported that they would like to be members of a natural resource management group given chance, while 2.4% reported not to be interested.
Of those who would want to be members of a natural resource management group, 74.8% reported if they joined the group, they would benefit from agricultural training offered, 19.6% said they would benefit from loan accessibility, while 5.6% said they would benefit from market accessibility.

3.13.7 Purpose and activities of the group

Ninety-seven (97%) of the groups reported were of C.B.O type while the rest 3% are reported their groups as being NGO’s.

The main purpose of these groups was poverty eradication (58%), followed by helping while a member is in need (21%); market accessibility (12%) and Loan provision (9%) respectively. See graph below.

Most members joined their groups between 1999 and 2002 (65.7%), followed by 1994-1998 (25.7%) and those who joined their groups earlier than 1988 were 5.7%, while the least percentage of household members (2.9%) joined their groups between 1989 and 1993.

3.13.8 Activities of the groups

The activities engaged in by group members include; pooling funds (37.9%), growing crops together (27.6%) and animal rearing (10.3%). The least activity reported was exchange of ideas (3.4%). See graph below.
3.13.9 Technologies/innovations adopted through the group

Most respondents (33.3%) have not adopted any technology/innovation from their respective groups while 23.8% had adopted commercial farming/marketing and agro-forestry (23.8%). The least percentage of respondents (19%) had adopted horticultural management technologies/innovations. See graph below.

3.13.10 Groups addressing issues of Natural Resource Management (NRM)

Thirty five percent (35%) of the respondents reported existence of groups in their villages addressing issues on natural resource management. The rest (65%) reported the non-existence of such groups in their respective villages.

The groups addressing issues of NRM mostly are involved in activities concerning agro-forestry (45%) followed by agricultural training (41%) and the least activity reported was vegetable cultivation (14%).
3.13.11 Technologies group members are using and promoting.

Majority respondents (42%) reported that group members are promoting agricultural training and agro-forestry (37%). The least technology being used and promoted is vegetable cultivation (21%). See pie chart below.

The greatest percentage (26%) of the respondents in their opinion reported that the most serious land and water problems affecting community action groups in their areas include; soil erosion (26%), followed by land degradation (24%). The least number of respondents reported small size of land (9%). See graph below.
3.14 Incentives for environmental management and communication channels

3.14.1 Factors that glue together members in a group

Most respondents 33% reported that they glued together in their groups by the rules and sanctions within the group, followed by goals (19%), co-operations (19%), Membership fee (10%) and Sound leadership (10%). The least gluing factor reported was resources (8%). See graph below.

3.14.2 Sources of information on technologies related to environmental management

Twenty-five (25%) of the total respondents reported that their source of information on technologies related to environmental management was extension workers (25%) and media 25%, followed by fellow farmers (18.3%) and agricultural officers (15%). The least percentage of respondents reported as obtaining information from cooperative societies (1.7%). See graph below.
3.15 Leadership within groups

3.15.1 Election of group leaders

Ninety percent (90%) of the respondents reported that leaders in their groups are voted into power following the principle one-man one vote. The rest of the respondents (10%) said no elections are done in their groups.

3.15.2 Rating of leadership groups

The majority of the respondents (71.8%) rated the leadership in their groups as being good, while the rest (28.2%) reported their group leadership as being average.

3.15.3 Qualities of good leadership

Majority respondents (25%) considered good leadership as the one with transparency, 14% considered good leadership as one in which the leaders are honest. The least percentage (5%) considered good leadership where leaders are engaged in communal work participation. See graph below