

Baseline Data on the Food Security and Household Income for Smallholder Farmers Research Projects

Volume One Aggregated Data

The Food Security and Household Income for Smallholder Farmers
Applied Research with Emphasis on Women
TARP II – SUA Project

June 2002

Prepared by

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PREFACE

This report contains baseline information from the survey that was undertaken at the commencement of activities by all the research projects under the project Food Security and Household Income for Smallholder Farmers in Tanzania (TARP II-SUA Project). As will be elaborated further in the report, the information has been organized in three volumes – the current one (volume one) containing a description of the methodology and a summary of the main findings and their implications, the second one (volume two) containing the complete data set from the survey, and the third one (volume three) containing the sub-project specific technical baseline data.

The baseline survey was undertaken as part of implementation of the TARP II-SUA project. The immediate objective of the project is to develop and put to use “Gender-sensitive and appropriate on-farm technologies for improving food security and household income for smallholder farmers in the Eastern and Southern Highlands zones”. To achieve this objective, the project set out a number of outputs which have to be attained during project implementation, one of which being to assess the impact of the research undertaken by the project. The collection of baseline information was done in order to establish benchmark indicators to be used during impact monitoring and during impact assessment at the end of the project period.

In recognition of the enormity and specialized nature of the activities under this component, the Project Implementation Team (PIT) assigned the tasks under the component to the Impact Assessment Team (IAT) consisting of members from Sokoine University of Agriculture (SUA), Ministry of Agriculture and Food Security (MAFS) and the Agricultural University of Norway (NLH) drawn from the different research subject areas covered by the researches being undertaken.

To equip IAT and PIT with the requisite knowledge to undertake these tasks, a training workshop on Impact Assessment Methodology was organized by PIT in December 2000. The workshop was followed by other two workshops involving project leaders – in January 2001 for the first batch projects (totaling 21) and in September 2001 for the second batch projects (totaling 14). Apart from imparting knowledge on impact assessment to the project leaders prior to the start of their activities, the workshops produced a comprehensive analysis of baseline information requirements under the different thematic areas under which the projects fell. The information was organized into a manual on Baseline Data Collection that has been quite useful in guiding the collection of the information presented in this report.

Apart from providing benchmark indicators for impact monitoring and for impact assessment of the on-going researches, the information contained in this report can be used in other endeavors. The overview presents valuable indicators that are useful in their own right giving highlights on the situation in the two zones on key issues. Development agents and researchers can use the detailed database to identify priority areas for their work.

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LIST OF ACRONYMS AND ABBREVIATIONS

DRD	Department of Research and Development
HHD	Household Head
IAT	Impact Assessment Team
MAFS	Ministry of Agriculture and food Security
NLH	Agricultural University of Norway
NORAD	Norwegian Agency for Development
SUA	Sokoine University of Agriculture
TARP II	Tanzania Agricultural Research Project Phase two
TAS	Tanzanian Shilling

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The Project Implementation Team (PIT) of the TARPII - SUA project along with the Impact Assessment Team (IAT) wish to thank all individuals who provided information and ideas during the implementation of these studies. In particular, they appreciate the contributions of all farmers and sub-projects members.

Last but not least acknowledgement is made to all individuals who in one way or another made this task a success. Special thanks go to Mr. N. Madalla, Mr. O. Mtinda and Mr. L. Nyato for technical assistance in preparing this report.

INTRODUCTION

1.1 About the Report

This report forms one part of a series of reports comprising the baseline survey for the TARP II – SUA Project on Food Security and Household Income for Smallholder Farmers. The baseline survey is comprised of two main data collection activities. The first involved the production of Village Profiles for each of the sub-projects where participatory, qualitative data collection methods were employed. These Village Profiles are produced under separate cover by sub-project. The second data collection activity involved an extensive household questionnaire survey where both general and sub-project specific data was collected. This volume – referred to as Volume I - contains an overview of the general part of the questionnaire survey giving details on the objectives of the survey, the methodology used and a synthesis of the major findings and implications of the work. The main body of the report is based on aggregate baseline survey data from all of the sub-projects. Volume II contains the complete data set from the general questionnaire survey. In all there are 35 sub-projects, which are grouped under 19 thematic areas. Volume II is divided into three parts as follows: general household characteristics, household income, and household food security. Volume III presents the topic-specific data collected by each of the sub-projects. This data varies by sub-project, although some of the data may be relevant for the other sub-projects from the same thematic area.

1.2 Background to the Study

Tanzania Agricultural Research Project Phase Two (TARP II) is a national research project under the Ministry of Agriculture and Food Security (MAFS) with support from various donors. The TARP II component, “Food Security and Household Income for Small-holder Farmers in Tanzania: Applied Research with Emphasis on Women” is a collaborative effort between the Division of Research and Development (DRD) in MAFS, SUA and the Agricultural University of Norway (NLH) with financial support from the Norwegian Government through NORAD. The component is under day-to-day management of SUA and hence referred to as TARP II – SUA Project.

To achieve its main objective, the TARP II – SUA project set out five outputs that need to be attained during the project implementation period. Among these outputs is assessing impact of the agricultural research under the project. The impact assessment output has the following key activities: (i) study on-farm impact of earlier research (done during the last 20 years); (ii) use existing baseline data and conduct a study on use of farm technology; (iii) conduct an end-line study of impact of the current project; (iv) disseminate findings to the international research community; (v) disseminate findings to extension agents and farmers; and (vi) communicate findings relevant for policy making to the Government of Tanzania and other stakeholders. This report on baseline data addresses directly the second activity under the output, while at the same time contributes to the third fourth and fifth outputs dealing with dissemination and communication of

results. The study was carried out using the baseline data collection manual produced under the same output through workshops held in January and September 2001.

The major objective of collecting baseline was to obtain information that will form benchmark indicators for impact monitoring during project implementation and for impact assessment of the projects at the end of the project period.

Apart from providing basis for impact assessment of the research, the baseline data along with the process used in its collection serve other useful roles in the on-going research. The data in Volume II is organized in thematic groups as described in the manual. This aspect gives the sub-projects opportunity for having comparative perspectives within thematic areas. Furthermore, the baseline information highlights strengths and weaknesses in the project areas that can be used by the sub-projects to adjust and fine-tune their activities to achieve higher impacts at the end.

1.3 Context of the research

Agricultural research has many outputs including the production of physical agricultural inputs such as improved cultivars, plant protection chemicals, machines, technology software packages such as agronomic practices for improved crop management, and social science research outputs, which include the identification and understanding of the social, institutional and policy context of technical innovation as well as the management of the research process. Development of improved crop varieties is the most well known type of agricultural research. It is among the research topics that have received highest resource allocation both locally and internationally. The research projects under the TARP II – SUA Project, though not covering all these research areas, exhibit the same trend, with research on improved varieties and development of improved production and management systems predominating.

New technology can have a paramount effect on agricultural producers' income and food security. According to an optimistic view of technology, it should lead to improved households' welfare through positive effects on consumers' food prices, producers' income and food security. But technological change may also have unintended effects that influence household welfare negatively. For example increased production reduces the food prices, which translates to lower producer welfare but less expenditure to food buying consumers.

In the context of TARP II - SUA Project, the baseline data is expected to provide a basis against which an assessment will be made on whether the project has contributed to an increase in household income and food security by smallholder farmers, with a particular emphasis on women farmers. Therefore, a better understanding of not only the technological aspects of agricultural production is needed, but also of the entire range of issues embedded in the concept of food security. Food security in this project refers to not only the availability of food through, for example, increases in production, but also women and men's access to food in a wider sense. It thus refers to a broad range of strategies farmers can choose from to ensure sustainable livelihoods which involves the

interaction of new technologies with economic, social and political processes. Addressing food security in this program also entails an understanding of and respect for local priorities and perceptions of what a better life might be. The program is thus implemented in ways which as much as possible promote local participation in the definition, development and assessment of research activities.

1.4 Structure of the report

The report is structured as follows. Following this introduction is a section on methodology, which explains the approach taken when conducting the survey and analysis. Section 3 then presents selected findings of the survey in seven sub-sections: household characteristics, asset ownership, food sources, household income, household expenditure, food security and coping strategies, and household labor use. Limited comments on the findings are made in each sub-section. Since the purpose of this report is to present the data from the baseline questionnaire survey in a simplified form, no attempt is made to draw any overall conclusions at this point. It is particularly important that the findings from this survey be seen in connection with the findings from both the qualitative part of the baseline and the specialized data from the specific sub-projects in any further analysis.

METHODOLOGY

2.1 Sampling

The household baseline data were collected for each site of the sub-projects. Most of the sub-projects have at least more than one village site. Data were collected by sub-project teams in collaboration with one or more members of the IAT, and data for the baseline were collected at the same time as the rest of the specific data needed by the sub-projects

The sample size and definition of the target groups for each of the sub-projects varied substantially according to the type of research being conducted. Some sub-projects used a very limited number of farmers while others used a large number of farmers. Consequently, the sample sizes per sub-project range from 16 to 160. It was recommended in the baseline manual that only contact farmers be interviewed using the household data sheets. The total number of households included in the questionnaire survey is 2320.

2.2 Data Collection

Formal household surveys were conducted to collect primary baseline data using data sheets as provided in the “Baseline Data Collection Manual” (TARP II - SUA publication). The Baseline Data Collection Manual” is based on a workshop on ‘Development of Impact Assessment Methodology’ held from 5-12 December 2000 and a meeting of the TARP II SUA Project Impact Assessment Team (IAT) and Research Project Leaders held from 4-5 January 2001.

The manual was used by research projects and IAT to guide gathering of baseline data which will help to assess the overall impact at the end of the project and beyond. Also, the manual provides an overview of the data collected. In addition to the data sheets for the overall project level, each research sub-project developed a questionnaire to collect data addressing their needs.

2.3 Data analysis

The household baseline data collected were coded by project and analysed quantitatively using SPSS and Excel software programmes. Descriptive statistics in form of means, frequencies and percentages of variables are used to report the baseline data.

The household baseline data are analysed and organised in terms of key issues as reflected in higher-level project goals. Several key parameters are presented gender disaggregated.

The variables used to describe household income include household resources in terms of land and livestock and sources of income. The variables used to describe assets are ownership of farm implements, land, livestock, and consumer items. For food sources, the variables include production, purchase, gifts and relief aid in terms of crops

and animal products. Variables for household income include income from sale of crops and animal products, casual labor, formal employment, remittances, and brewing. Household expenditure considers food and non-food expenditure, by gender. Labor use presents time spent on production activities by gender, and food security and coping strategies considers the food deficit/surplus situation in months, seasonally.

2.4 Presentation of the data

The data are presented in a series of graphs and tables which report the following:

Averages: Average values of the different quantities e.g. average amount of money spent, average amount of money obtained from sale etc.;

Totals: Totals for amounts;

Percentages: percentages of counts and amounts;

Counts: Counts of households that gave the particular indication e.g. counts of households owning a particular type of asset;

Ranking: The various sub-items (e.g. assets) were ranked in terms of counts in descending order, i.e. a sub-item with the highest number of counts had a ranking of one.

In the current volume the data is presented in a table with a column showing the overall values (counts, averages, totals and percentages) against the respective sub-items.

The tabulated information of the database is presented in graphical form (except for table 1) in order to facilitate discussion of the main findings. To make the figures simple and more readable, the number of items presented on the graphs was limited to the five most high-ranking items. While the graphs in the main body of the report, and the tables in annex 1 are based on aggregate data for the entire project area, some of the graphs have also been produced by project in annex 3. This is to show some of the possible variation in the data between sub-projects, which is not possible to observe at the aggregate level, and give a better picture of the variations between target groups. It is hoped that such comparisons will encourage further analysis of the relationships between the sub-project and overall project levels.

2.5 Limitations of the baseline data

Limitations and deficiencies within the baseline data contained in the three volumes can be put under two categories: those arising from the data collection (questionnaire administration) include the fact that:

- The sampling of villages and contact farmers is done by each of the 35 sub-projects based on the research agenda of each sub-project. The baseline does therefore not reflect a representative sample of farmers from EZ and SHZ.

- Data were collected by individual sub-projects, hence there is chance of bias due to differing perspectives.
- In some cases household questionnaires were administered to a broader base of farmers in the village instead of contact farmers only. This will cause some difficulty in tracing back the people during future surveys for impact monitoring and end-of-the-project study. During these studies, it will be necessary to limit the survey to the contact farmers except where non-contact farmers are included for comparative purposes to get the ‘with’ and ‘without’ comparison for impact assessment.
- The data had quite a number of missing values for some of the items. Most notable of these were the items on homegrown food crops and on staple foods. To mitigate the effect of this, IAT has planned to include the items for which information was not adequate in the data that will be collected as part of the impact monitoring. Data to be included in impact monitoring will also include data that is missing as a result of deficiencies in the questionnaire administered.

Limitations arising from the analyses are mainly due to:

- Data was analyzed at overall project level, theme level and sub-project level, however not at village level. This was done in order to limit the size of the database and thus make it more readable. For overall impact assessment purposes, analyses at these levels are sufficient at this point in time. The sub-projects, however, will need to analyze their data at village level in order to be able to understand differences arising from i.e. agro-ecological differences between the research sites. For this reason, raw data in SPSS format was given to the projects to enable them to carry out further analysis on their own if they wished;
- Quantitative amounts given in the tables are only indicative since the units used by the sub-projects were not uniform except where they refer to monetary values for which the unit used is the Tanzanian Shilling (TAS).

MAJOR FINDINGS AND OBSERVATIONS

3.1 Household characteristics

Households in the survey area were mostly headed by males as shown in figure 1. However, the proportion of female headed households is significant implying that the results of the survey have inputs from both types of households. The household heads were predominantly married people followed by single and widowed.

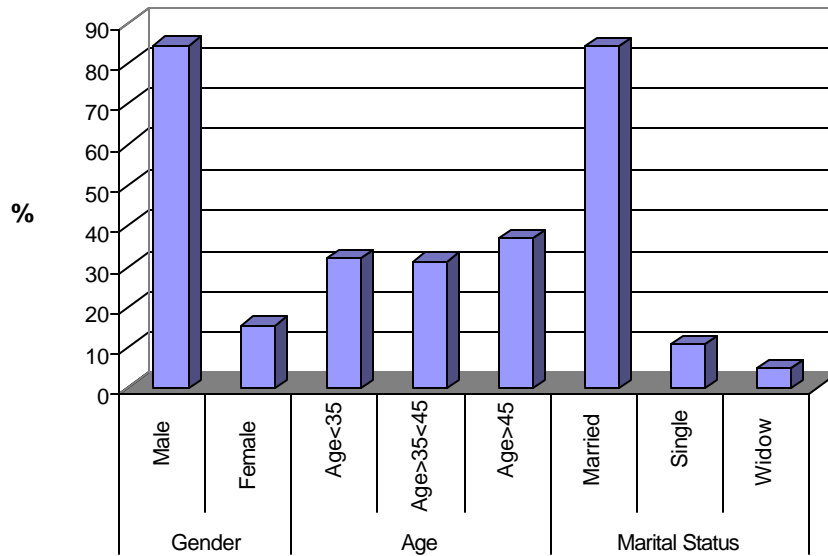


Figure 1: Gender, Age and Marital status of household heads

The level and type of education for the majority of the household heads was primary school education. These were followed by those with “informal” type of education (Figure 2). As anticipated, the majority of the household heads in the survey area were farmers.

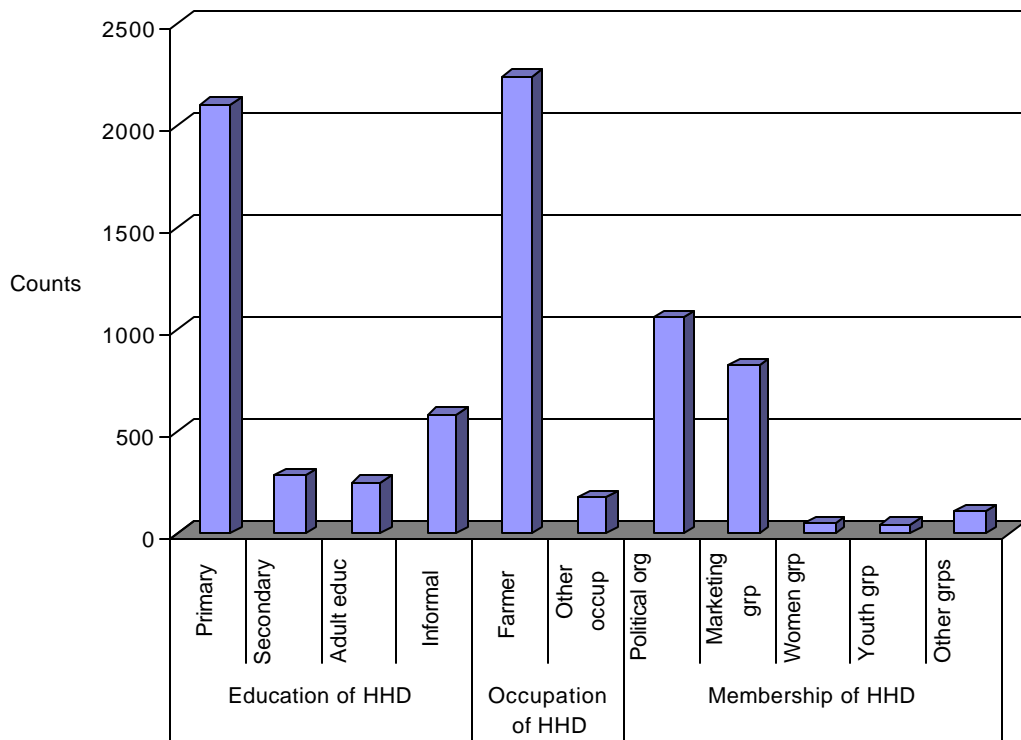


Figure 2: Education, Occupation and Membership in organisations of household heads

In depth observation of the education pattern of the households (Figure 3) indicates that children (sons and daughters) formed the majority of those having primary and secondary education whereas the adults (husbands and wives) predominated among those with adult education.

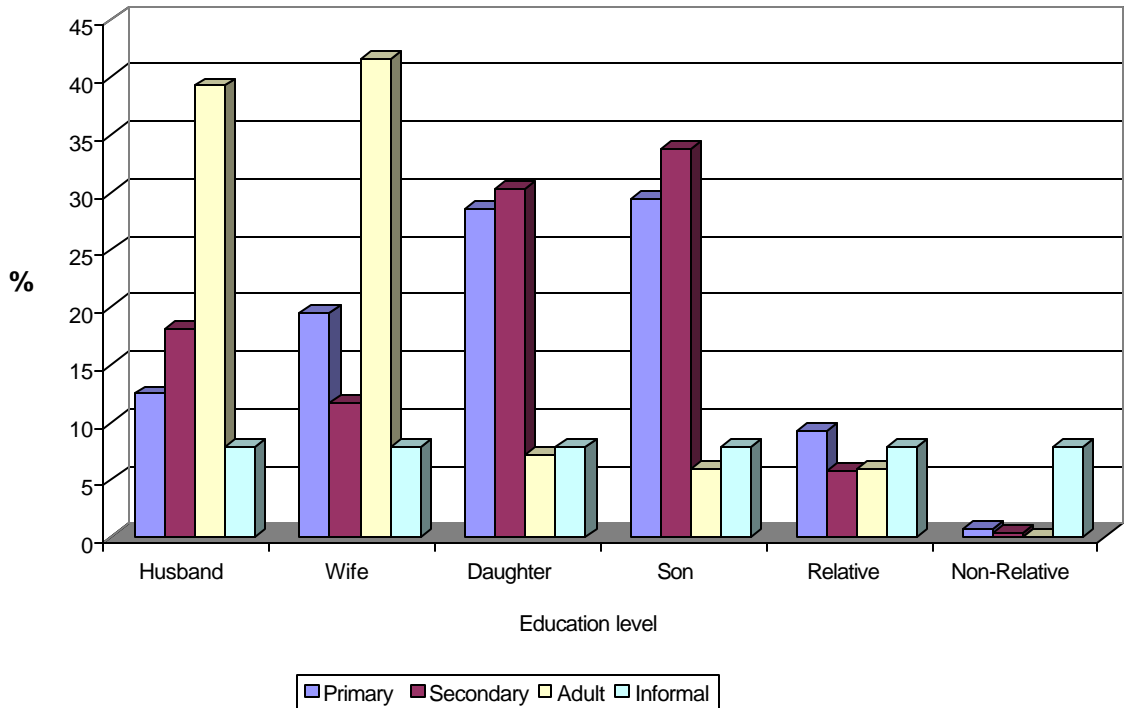


Figure 3: Household education pattern

As shown in figure 4, the majority of the households were of “medium” size (having between 4 and 10 people) followed by small households (with less than 4 people). Large households with more than 10 were few. The majority of the married household heads had only one wife.

The household age distribution was predominated by young children below 12 years of age. The results of the survey also show that households have a substantial proportion of other relatives living in the household (Figure 5).

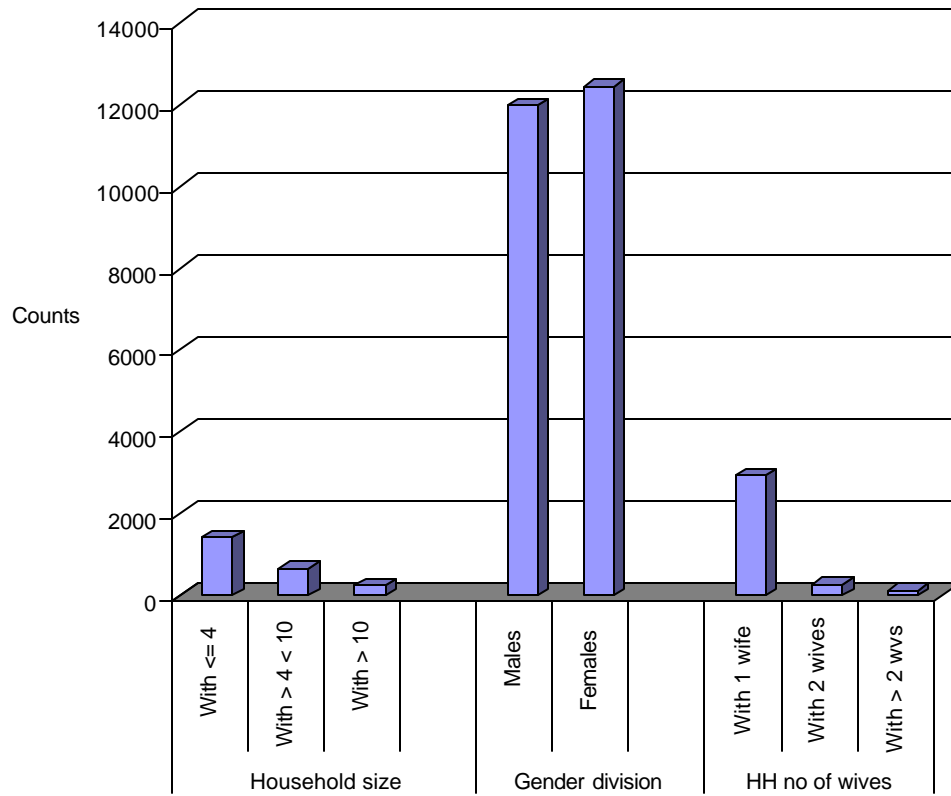


Figure 4: Household size, gender division and number of wives

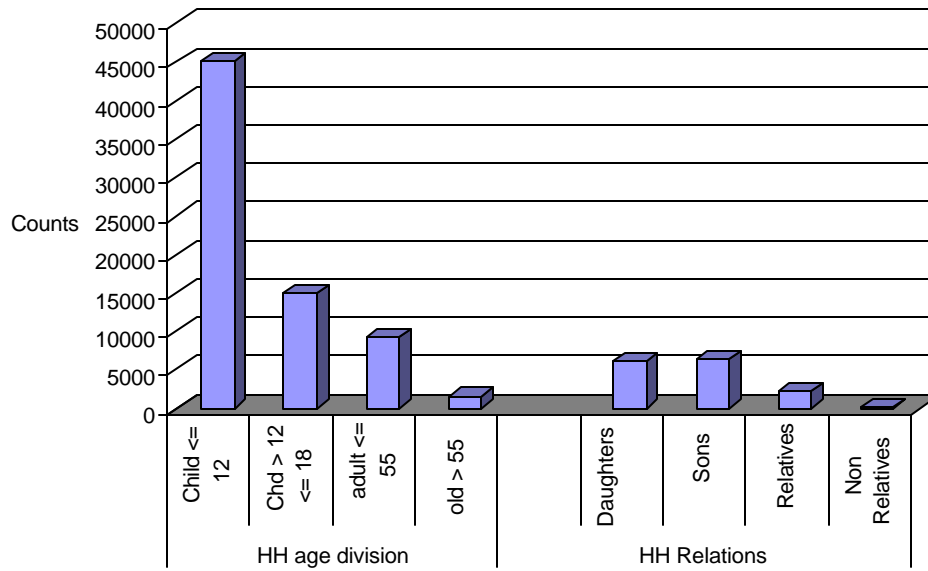


Figure 5: Household age division and relations

Membership in groups and organizations was found to be mainly in political organizations where husbands and wives predominated, in marketing groups – where sons and daughters predominated and in women groups where wives predominated (see Figure 6).

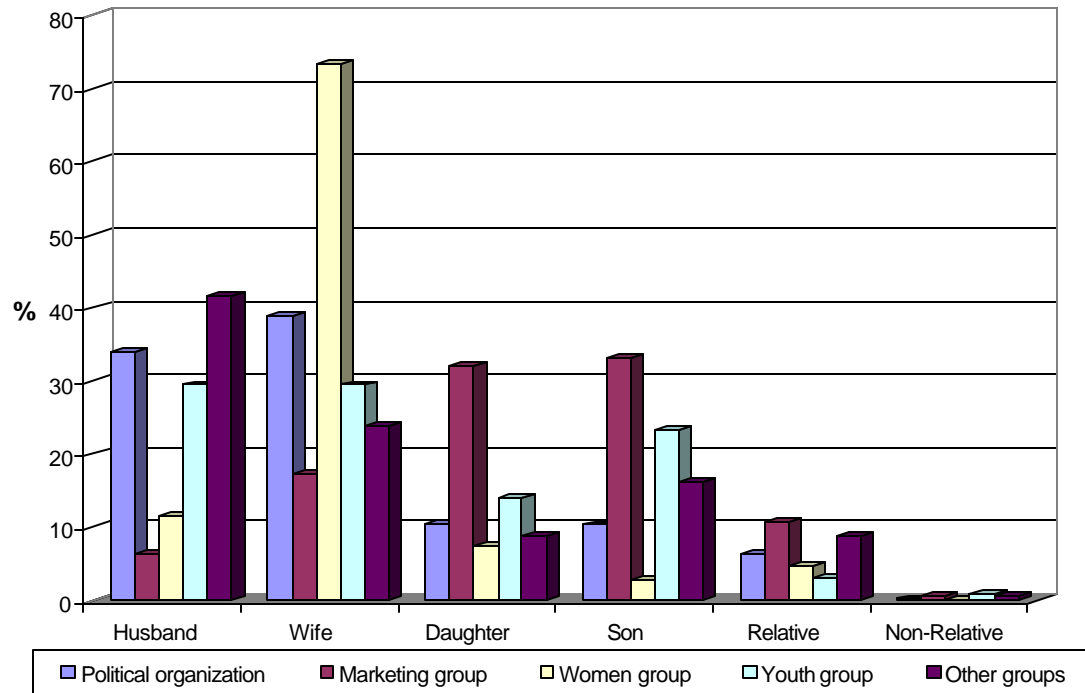


Figure 6: Household group membership

3.2 Asset Ownership

The “perception” of ownership of various household assets varied among the three groups distinguished during the interview, i.e. assets regarded to be owned by males, assets regarded to be owned by females and assets regarded to be owned by both males and females. Among the assets owned by males, the highest number mentioned the hand hoe, followed by bicycle, land, machete and sickle – see figure 7. For assets owned by females, the order was hand hoe, land, chicken, sickle and bicycle. These figures reflect typical pattern of asset ownership under existing technology and socio-cultural conditions in the rural areas. Considering assets that are regarded to be to be owned by both males and females, the pattern changes again, with the hand hoe being an important tool taking the lead, followed by land, chicken, machete and sickle.

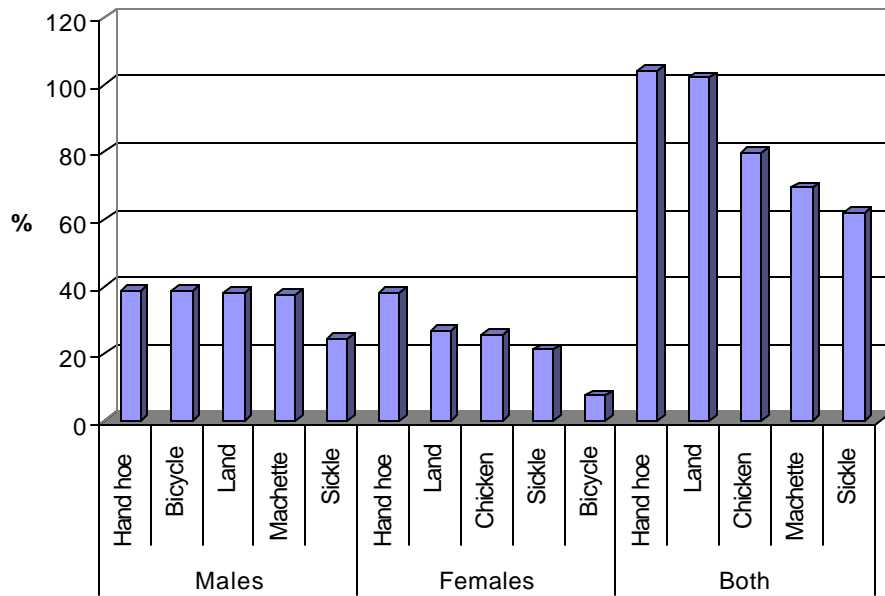


Figure 7: Ownership of five top most ranked assets by groups

These “perceptions” and the type of assets owned is likely to change with the introduction of new technologies and changes arising from acquisition of new perspectives brought about through new knowledge and skills.

Assets that did not feature prominently in the baseline data were those related to farm power. The source of farm power symbolizes the accompanying set of agricultural equipment and the level of annual capital inputs in the farm. The source of farm power also indicates the wealth status of the farmer. The use of farm machinery like tractors would be more common where power intensive operations such as tillage and transport are an essential input in the production process particularly in land abundant areas. On the other hand, use of machinery is influenced by a number of factors including costs of alternative sources of farm power, availability of capital, availability of labor, wage rates and more importantly the profitability of using machinery. Despite the fact that crop production in Tanzania is power-intensive, use of tractors is uncommon among the smallholder farmers. Farmers in the research areas rely mostly on human labor as will be shown in the discussion on labor use below.

Apart from power, agricultural production is constrained by the inadequacy of the various agricultural technologies in use. The TARP II – SUA project has introduced a range of technologies in the study areas that are expected to increase agricultural output and farmers’ income in the research areas.

Land is an important asset in rural households. However, there are great differences in access to and ownership of land between households. Female-headed households have less access to land compared to their male counterparts. Land ranked second among the assets cited by females. Available evidence indicates that unequal access to land has

influence on the decision to adopt or not to adopt better farm technologies. For that matter, land ownership will be among the important factors to consider during the whole process of impact assessment of the current research projects.

3.3 Food Sources

The most frequently cited food crops grown by the farmers in the research areas were, in descending order, maize, beans, wheat, paddy and bulrush millet (Figure 8).

Figure 9 gives an overview of other food sources, apart from the food cultivated by the household members. A number of respondents purchase food, while few respondents receive food as gifts and only a very small proportion of the respondents receive food aid. The numbers of respondents who have indicated purchased food as well as gifts and relief aid are however very small compared to the size of the total sample.

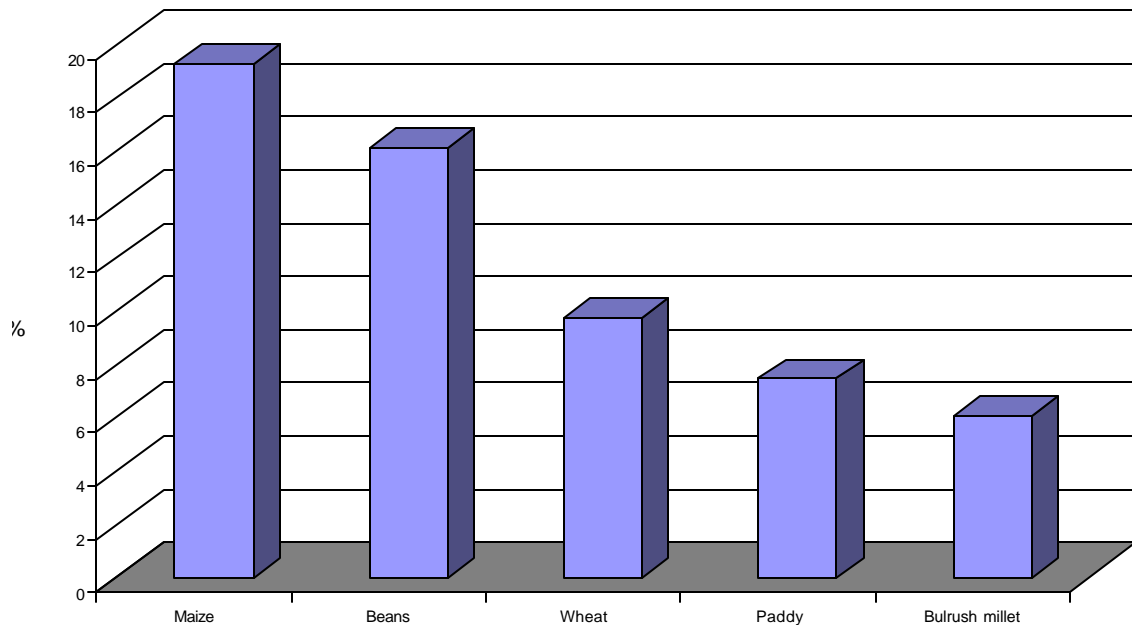


Figure 8: Five top most ranked homegrown foods

Much more food is purchased in the dry season as compared to the wet season (Figure 10). Among purchased food, maize has by far the highest quantity, followed by rice, beans, fish and meat. Even for food received as gifts or aid, there is a tendency that most of it is received in the dry season.

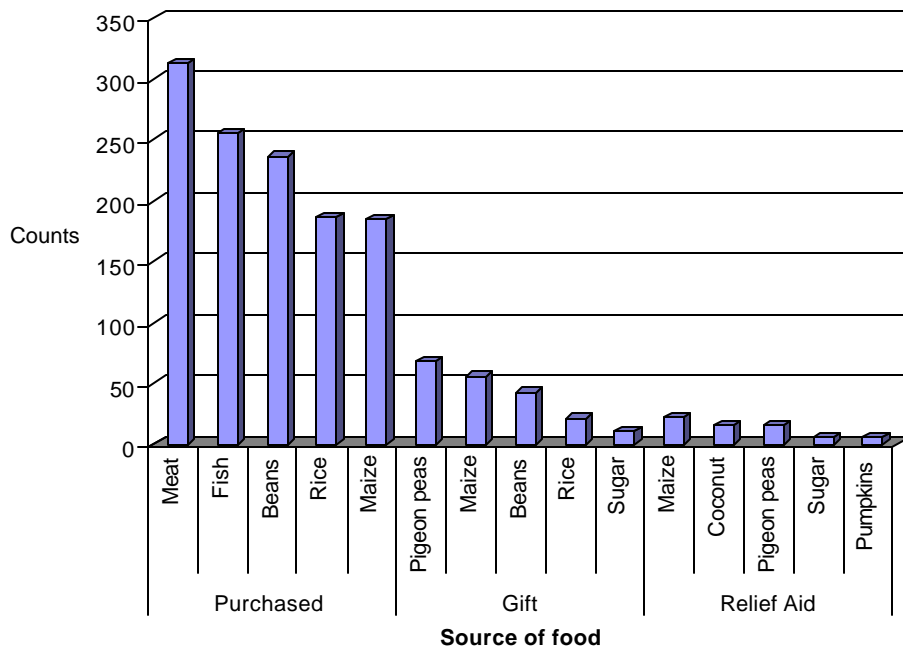


Fig 9: Other food sources used in villages

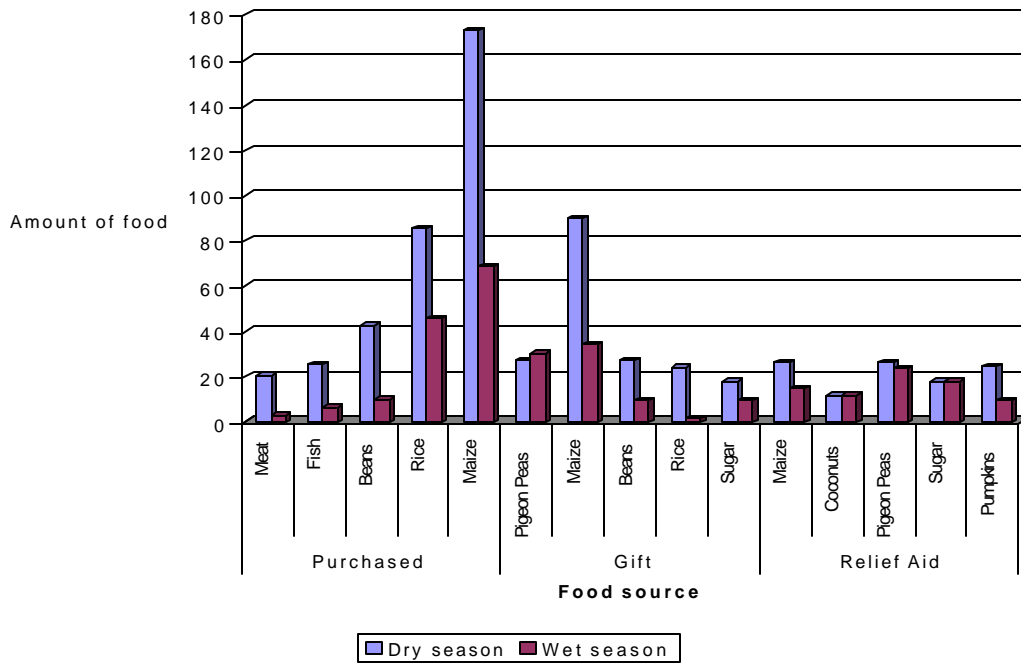


Figure 10: Quantity of food from other sources used in villages during dry and wet seasons

3.4 Household income

Household income in the research area came from sale of crops (Figures 11 and 12), sale of livestock (Figures 13 and 14) and from various other income sources including casual labour, formal employment, various types of remittances, and brewing (Figures 15 and 16).

Maize appeared to be regarded as the most important income-earning crop for both women and men. Other important income earning crops were rice, beans, sweet potatoes, coffee and groundnuts (Figure 11).

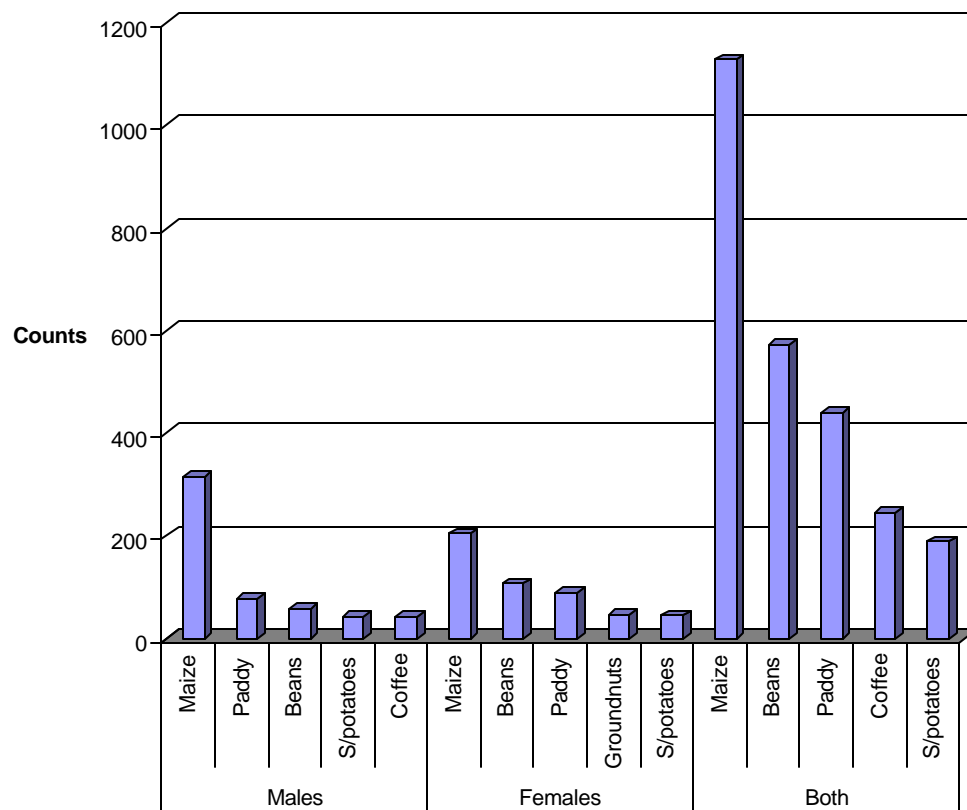


Figure 11: Number of households selling crops

Even when it comes to the total amounts earned from crop sales, maize features highest among men, but closely followed by rice. Among women however, rice comes before maize (Figure 12).

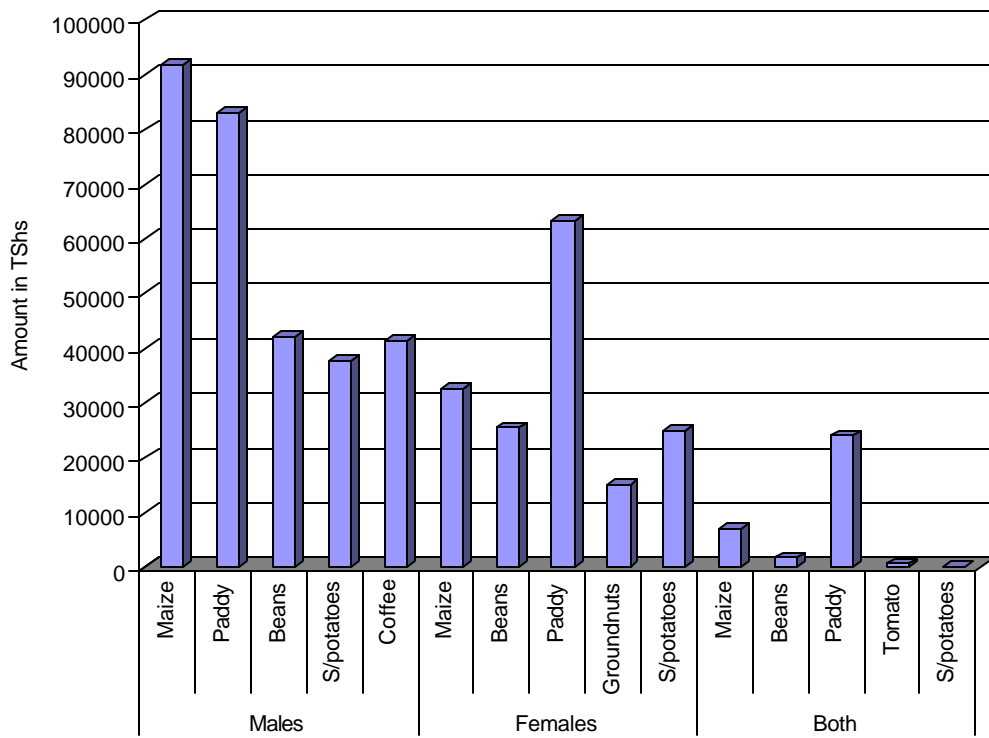


Figure 12: Income from crop sales

Chicken was the most frequently mentioned livestock for sale by both genders. Other important livestock products included cattle, milk, goats and pigs (Fig. 13).

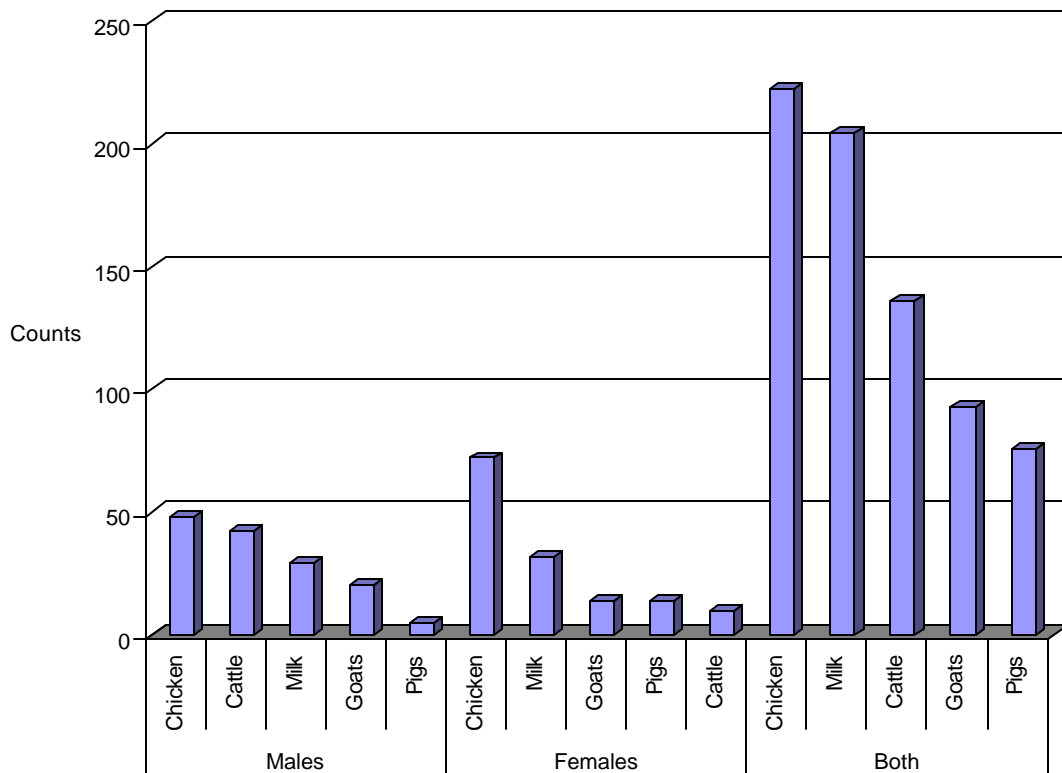


Figure 13: Number of households selling livestock and livestock products

The amounts of income from various household products (Table 14) show a different pattern from the number of households selling livestock products. Though chickens are sold by the highest number of households, the income from this sale is modest. In terms of income cattle is the most important livestock product for men, while milk is the most important one for women and for men and women together.

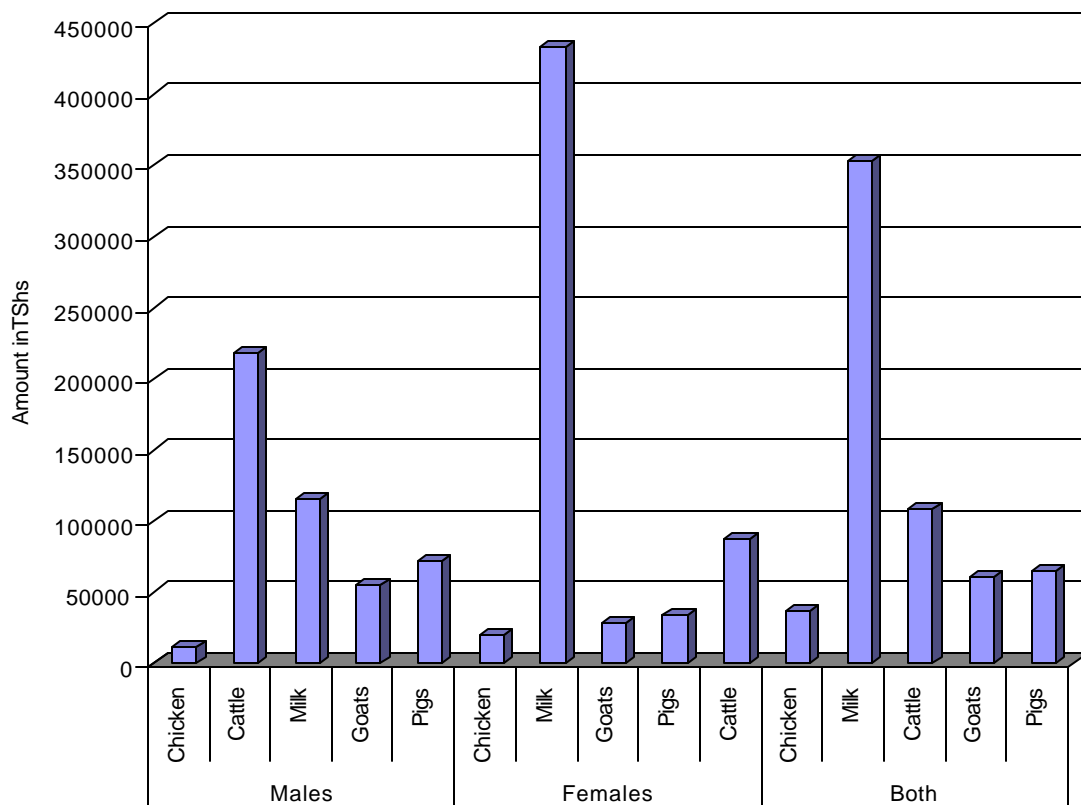


Figure 14: Income from livestock and livestock products

For the other sources of income, was the most prevalent one among men, followed by ‘unspecific’ income sources, followed by formal employment. Among females, the highest ranked source was brewing, followed by casual labor followed by ‘unspecific’ income sources. For the males and females together, the unspecified income sources ranked highest followed by brewing followed by casual labor (Figure 15).

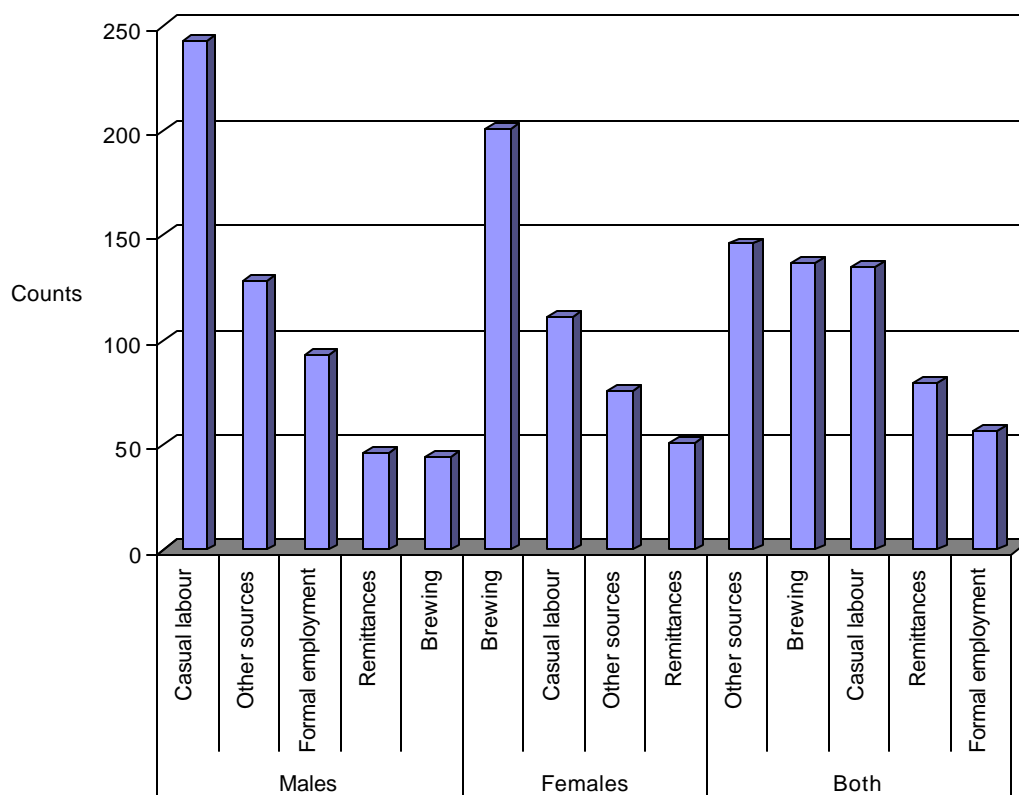


Figure 15: Number of households with income from other sources

In terms of the amounts earned from various income sources, formal employment ranked highest among males whereas the unspecific income sources ranked highest among the females, closely followed by brewing. Among the ‘both male and female’ category, formal employment and the unspecific category were about equally large.

Improvement of household income is one of the key objectives of the TARP II – SUA project and as such, it is expected that there will be significant changes in the pattern and relative importance of the various sources of income occurring among the contact farmers during the project implementation period. For that matter, collection of information on household income will constitute one of the key aspects to be included in impact monitoring.

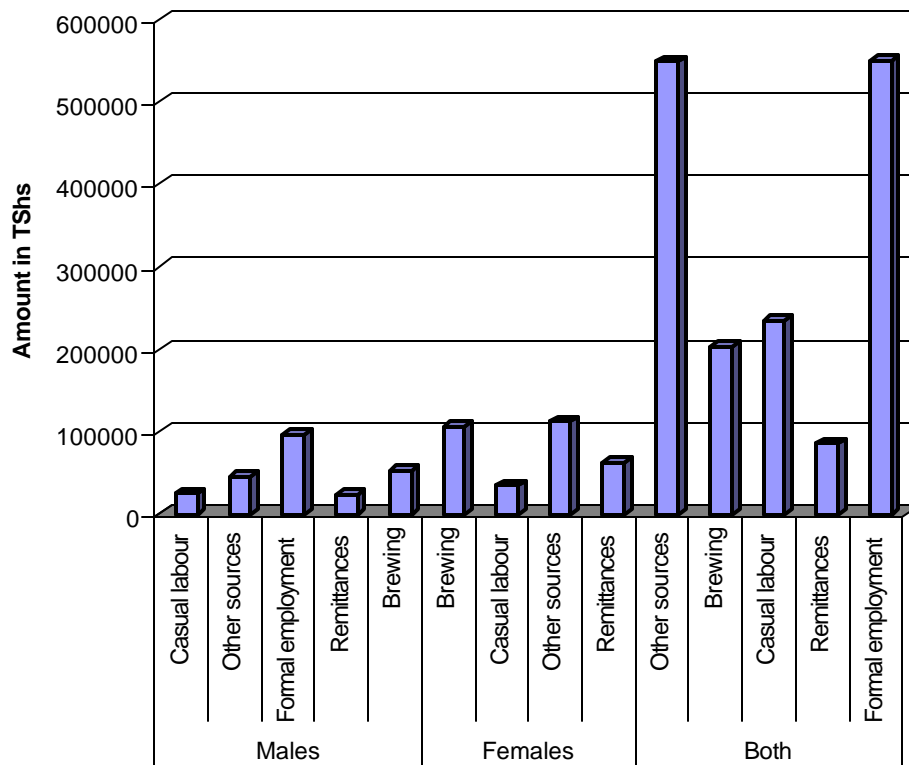


Figure 16: Income from other sources

3.5 Household Expenditure

Household expenditure gives indication of household income, and above all, it gives indication of the priorities attached to the different purchased items by the respective groups.

Apart from the food purchases presented earlier, households in the research areas purchased various types of livestock and other non-food items. The relative importance of these items varied among the groups. In terms of household counts, chicken ranked highest among the males, whereas ducks ranked highest among the females group and the males and females together (Figure 17). The number of households that reported buying livestock is however small, and the predominance of ducks in the diagram is hardly representative for the two zones (most can be accounted for in one project area).

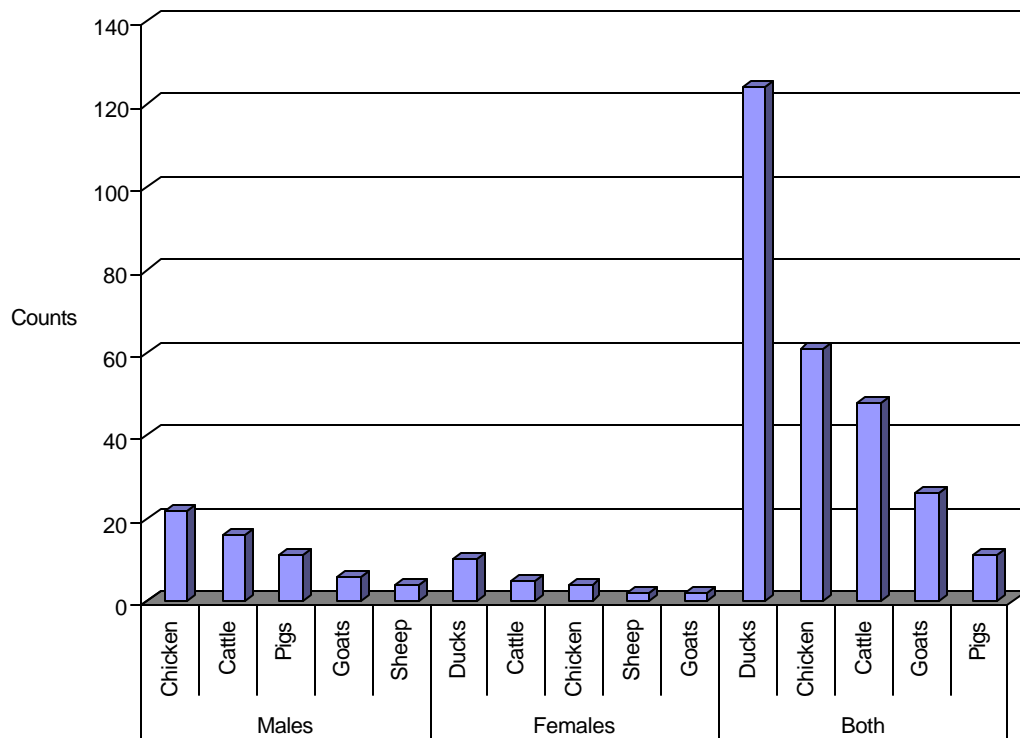


Figure 17: Number of households that purchased livestock

In terms of average amounts spent among those who purchased livestock, cattle had the highest expenditure among the males and the ‘males and females’ categories, whereas ducks and goats ranked highest among females (Figure 18). From common understanding of asset ownership under prevailing social conditions, figures 17 and 18 present the typical reality where cattle are regarded as male assets and small stock such as chicken and ducks as female assets.

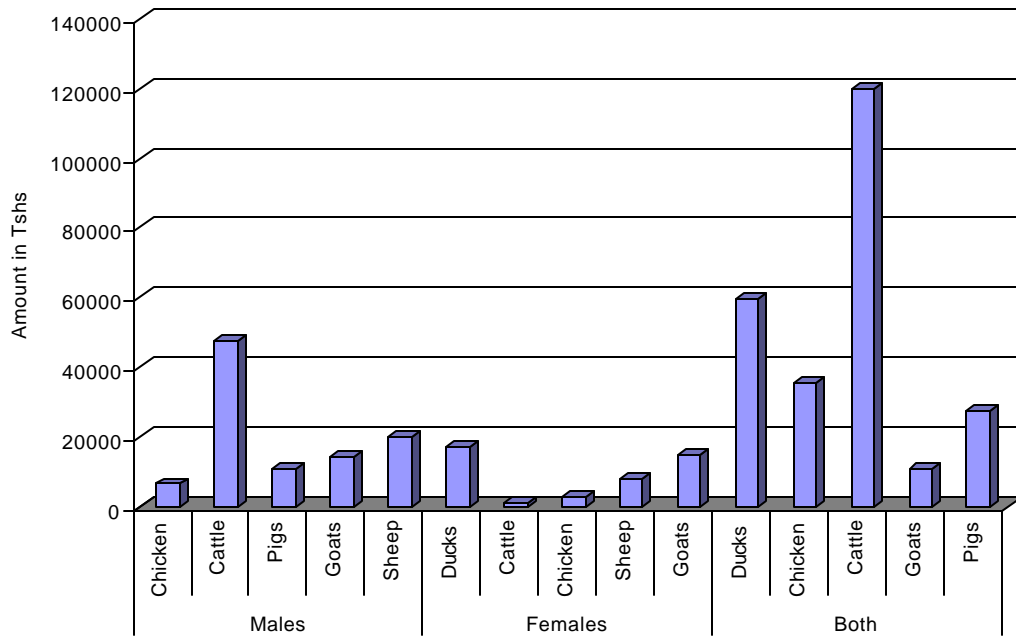


Figure 18: Average amount paid for livestock purchase

Among the non-food items, the pattern of expenditure was the same in all three groups for the five most purchased items. This indicates the order of importance attached to these items: clothes came first followed by medicines, education, levies and drink refreshments (Figure 19).

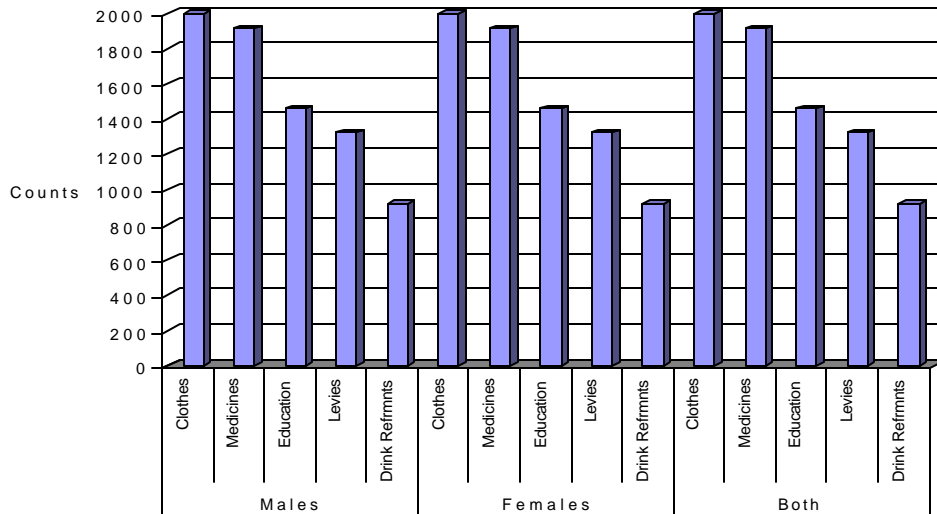


Figure 19: Household counts with spending on non-food expenditures

Figure 20 shows that among the items for non-food expenditure, drinks refreshments had the highest expenditure among the males group followed by education, while

education followed by clothes was the highest expenditure by women and by men and women together.

Purchase of agricultural inputs, which are directly related to the production goals and objectives of the households, was observed to be at a very minimal level. None of these items featured among the five highest ranked items. Pesticides ranked six, fertilizers seven and seeds eight among non-food items purchased under all the three groups. Not only did few households report to spend some of the household income on farm inputs, but also the proportion of expenditure on farm inputs was lower for these items compared to the items represented in figures 19 and 20. These observations partly explain the reality of the situation among smallholder farmers. For example, it is highly unlikely that small farmers would purchase seeds from the market especially if they can propagate the seeds themselves. It could also be possible that the lack of cash and low profitability would influence the level of use of purchased farm inputs. Since the current study touches some of these factors, the picture may change over the project period.

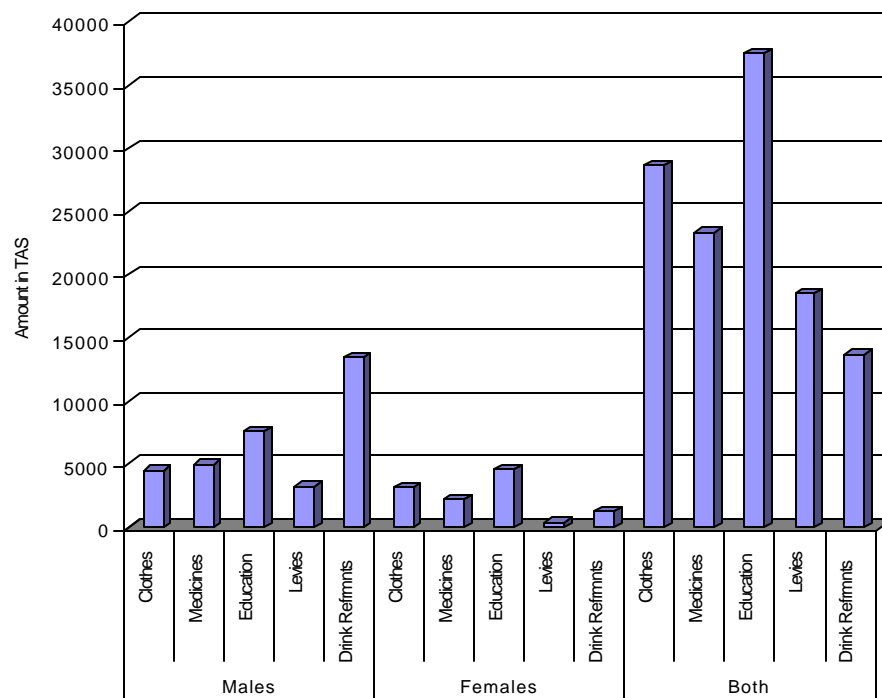


Figure 20: Non-food expenditures

3.6 Food insecurity and coping strategies

Table 1 shows that the length of the food deficit periods in the dry and wet season varies among households. Whereas the majority of the people cited a period between one and

two months, there were some who cited longer periods up to five months. Reduction in the food deficit period among the contact farmers will be an important indicator of success for the TARP II – SUA research projects.

Table 1: Seasonal Patterns of food surpluses and deficits

Rank	Cited length	Number of Households
Food Surplus in Dry Season		
1	6 Months	609
2	3 Months	345
3	4 Months	305
4	5 Months	274
5	2 Months	188

Table 1: Seasonal Patterns of food surpluses and deficits (contd)

Rank	Cited length	Number of Households
<hr/>		
Food Surplus in Wet season		
<hr/>		
1	1 Month	288
2	2 Months	268
3	6 Months	264
4	3 Months	248
5	4 Months	172
<hr/>		
Food Deficit in Dry season		
<hr/>		
1	1 Month	274
2	2 Months	243
3	3 Months	221
4	4 Months	115
5	5 Months	66
<hr/>		

Table 1: Seasonal Patterns of food surpluses and deficits (contd)

Rank	Cited length	Number of Households
Food Deficit in wet season		
3	2 Months	416
2	3 Months	413
1	1 Months	270
4	4 Months	231
5	6 Months	128

Food insecurity coping strategies used by households in the research areas were several as shown in figure 21. Most important among these was casual labour. This strategy could have negative implications on the labour situation for own agricultural production, especially if the period when labour is sold coincides with peak production period.

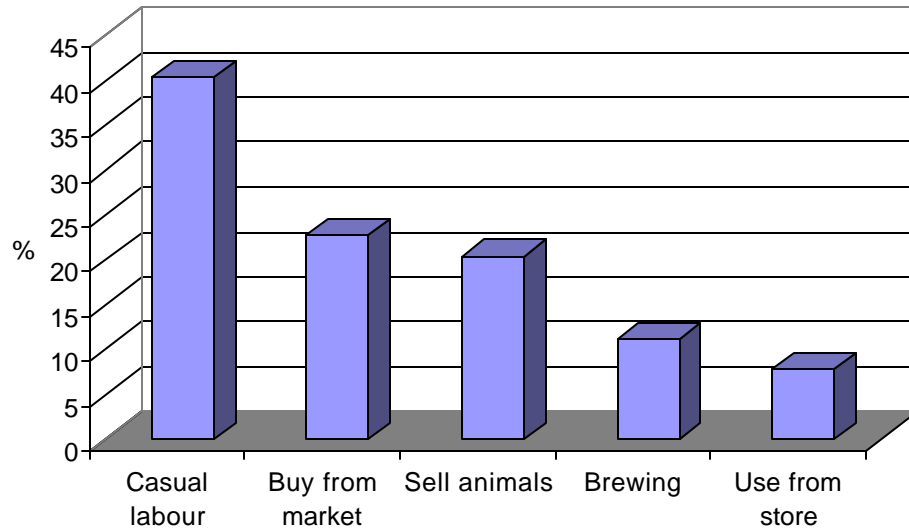


Figure 21: Food insecurity coping strategies

3.7 Household Labour Use

Family labour and land are two important resources available to smallholder farmers in Tanzania. The distribution of labour within the household (including the level and availability) is an important factor in technology adoption.

Household counts on the most frequent agricultural activities are presented in Figure 22. As expected, more or less all the farming families are involved in land preparation and planting, while only about half of them do any kind of processing of their farm products.

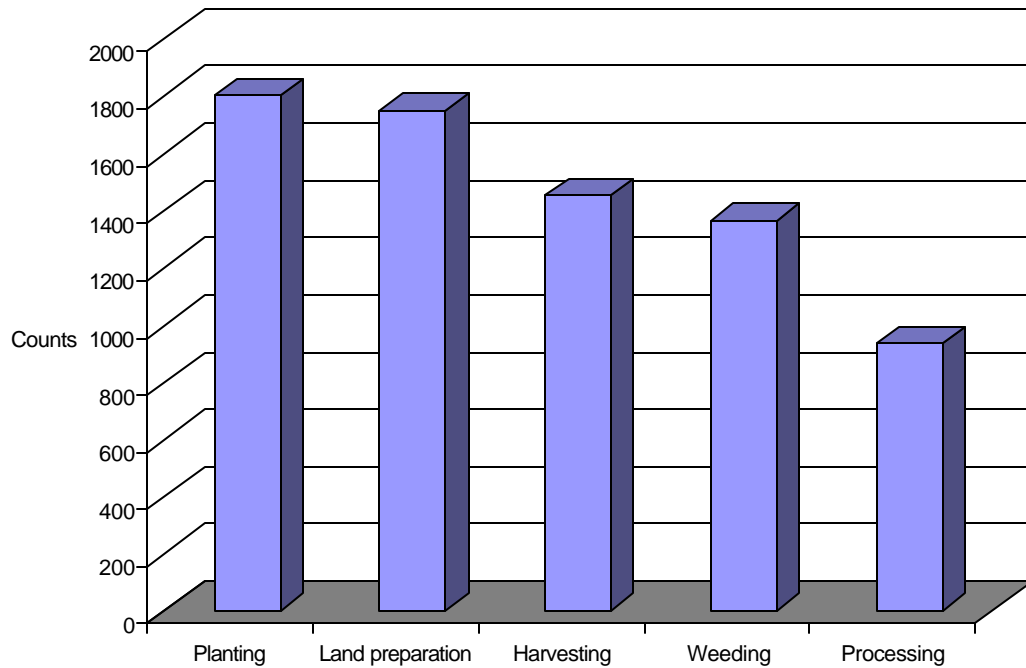


Figure 22: Household counts on production activities

As it is common in the traditional farming systems, labour for agricultural production is largely coming from the family and in most cases it is shared between members of the household, whereas females perform most of the reproductive chores. Figure 23 shows that males are more involved than females in planting, while females are more involved than men in food processing. Women and men appear to be fairly equally involved in land preparation, harvesting and weeding.

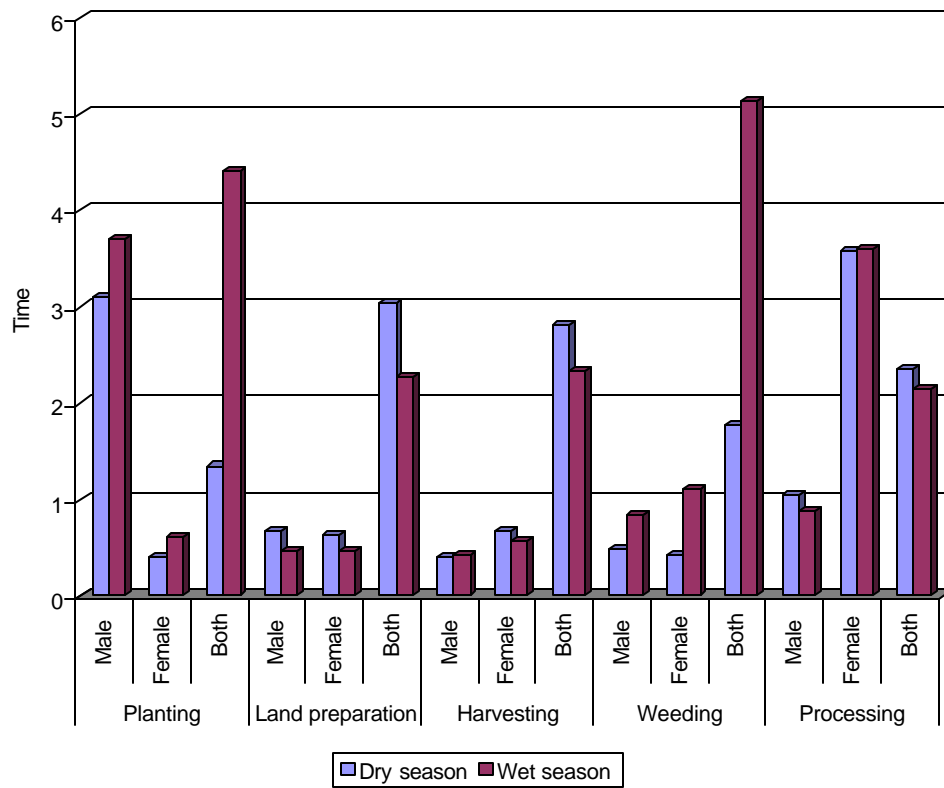


Figure 23: Time spent by gender on production activities in different seasons

While Figure 23 shows a fairly equal distribution between men and women for the production activities, it is evident from figure 24 that women are far more involved than men in all reproduction activities. When seeing figure 23 and 24 together, the indication is therefore a high workload for women.

One of the implications of this finding is the need to develop technologies that would lessen women workload in activities where they are mostly involved. Stated otherwise labour saving technologies for women are very relevant under these circumstances taking into account also the seasonal variations.

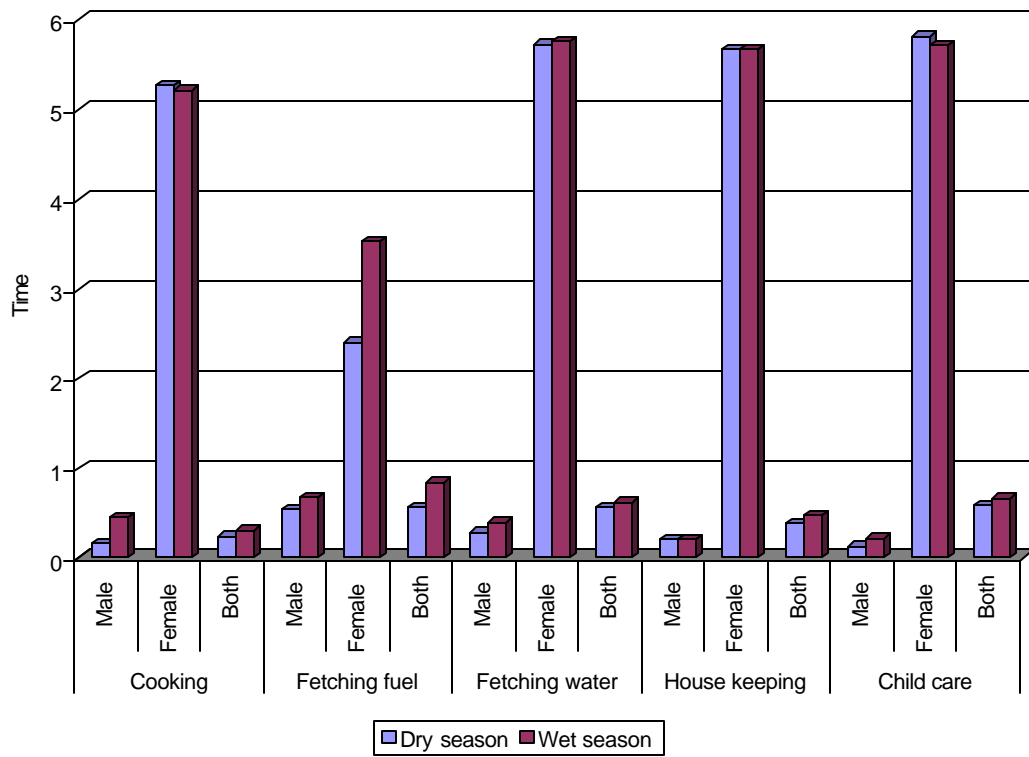


Figure 24: Time spent by gender on production activities in different seasons

ANNEXES

4.1 Annex 1: Tables of results

Table A1: General particulars of household heads

Item	Category	Counts	Percent
Gender	Male	2793	84.8
	Female	502	15.2
Age	0-35 years	1105	32.3
	36-45 years	1070	31.2
	> 45 years	1250	36.5
Marital status	Married	2401	84.0
	Single	318	11.1
	Widow	138	4.8
Education of Household Head	Primary	2104	65.2
	Secondary	283	8.8
	Adult education	253	7.8
	Informal	586	18.2
Occupation of Household Head	Farmer	2239	92.7
	Other occupation	177	7.3
Membership of Household Head	Political organisation	1057	50.7
	Marketing group	823	39.5
	Women group	51	2.4
	Youth group	44	2.1
	Other groups	108	5.2

Table A2: Household education patterns

Category	Primary		Secondary		Adult		Informal	
	Counts	%	Counts	%	Counts	%	Counts	%
Husband	1491	12	203	18	99	39	342	8
Wife	2333	20	130	12	105	42	868	20
Daughter	3414	29	340	30	18	7	1229	28
Son	3528	29	378	34	15	6	1346	31
Relative	1101	9	64	6	15	6	591	13
Non-relative	95	1	4	0	0	0	25	1

Table A3: General household characteristics

Item	Category	Counts	%
Household size	1-4	1421	33
	5-10	2665	62
	> 10	234	5
Gender division	Males	11966	49
	Females	12433	51
Number of wives in the household	1 wife	2932	89
	2 wives	267	8
	> 2 wives	102	3
Age division of all members of households	0-12	45519	64
	13-18	14961	21
	19-55	9281	13
	> 55	1587	2
Relation to head of household	Daughters	6037	41
	Sons	6338	43
	Other relatives	2171	15
	Non-relatives	133	1

Table A4: Household group membership

Item	Husband		Wife		Daughter		Son		Relative		Non-Relative	
	Counts	%	Counts	%	Counts	%	Counts	%	Counts	%	Counts	%
Political organization	711	34	817	39	217	10	216	10	134	6	3	0
Marketing group	368	6	1019	17	1884	32	1953	33	625	11	36	1
Women group	20	12	126	73	13	8	5	3	8	5	0	0
Youth group	38	29	38	29	18	14	30	23	4	3	1	1
Other groups	75	42	43	24	16	9	29	16	16	9	1	1

Table A5: Asset ownership by groups

Group	Asset	Rank	Counts	Average Quantity Of Assets Owned
Males	Hand hoe	1	902	2
	Bicycle	2	899	1
	Land	3	882	8
	Machete	4	874	1
	Sickle	5	567	2
Females	Hand hoe	1	885	2
	Land	2	621	4
	Chicken	3	596	10
	Sickle	4	493	4
	Bicycle	5	176	2
Both	Hand hoe	1	2420	4
	Land	2	2373	7
	Chicken	3	1859	14
	Machete	4	1614	2
	Sickle	5	1435	2

Table A6: Home grown food types and consumption patterns

Crop	Rank	Counts	Average Amount Consumed	
			Dry Season	Wet Season
Maize	1	448	356	67
Beans	2	373	365	200
Wheat	3	226	129	26
Rice	4	173	146	13
Bulrush millet	5	141	265	5

Table A7: Staple foods and their ranking in villages

Item	Rank	Counts
Maize	1	433
Rice	2	242
Sweet potato	3	215
Cassava	4	213
Beans	5	168

Table A8: Other food sources used in villages

Item	Food Item	Rank	Count	Average Amount	
				Dry Season	Wet Season
Purchased	Meat	1	313	21	3
	Fish	2	255	25	6
	Beans	3	237	43	10
	Rice	4	187	86	46
	Maize	5	185	173	69
Gift	Pigeon peas	1	68	27	30
	Maize	2	56	90	34
	Beans	3	43	27	9
	Rice	4	21	24	2
	Sugar	5	11	18	10
Relief aid	Maize	1	23	26	15
	Coconuts	2	16	12	12
	Pigeon peas	3	16	26	26
	Sugar	4	6	18	18
	Pumpkins	5	6	25	9

Table A9: Crop incomes by groups

Group	Crop	Rank	Counts	Average Amount
Males	Maize	1	214	91926
	Rice	2	78	82926
	Beans	3	58	42079
	Sweet potatoes	4	43	37847
	Coffee	5	42	41421
Females	Maize	1	204	32518
	Beans	2	107	25481
	Rice	3	89	63315
	Groundnuts	4	47	15043
	Sweet potatoes	5	44	25091
Both	Maize	1	1128	6985
	Beans	2	573	1823
	Rice	3	441	24017
	Coffee	4	246	633
	Sweet potatoes	5	188	64

Table A10: Incomes from livestock and livestock products by groups

Group	Type Of Product	Rank	Counts	Average Amount
Males	Chicken	1	48	11625
	Cattle	2	42	217976
	Milk	3	29	116035
	Goats	4	20	55700
	Pigs	5	12	71667
Females	Chicken	1	72	20078
	Milk	2	32	433391
	Goats	3	14	27929
	Pigs	4	14	33429
	Cattle	5	10	87000
Both	Chicken	1	222	36605
	Milk	2	204	349306
	Cattle	3	136	108838
	Goats	4	93	60376
	Pigs	5	76	65540

Table A11: Income from other sources by groups

Group	Income Source	Rank	Counts	Average Amount
Males	Casual labour	1	331	24486
	Other sources	2	182	45198
	Formal employment	3	132	96014
	Remittances	4	58	23103
	Brewing	5	57	53223
Females	Brewing	1	287	106436
	Casual labour	2	130	34525
	Other sources	3	124	111763
	Remittances	4	61	62544
Both	Other sources	1	190	444673
	Brewing	2	171	185104
	Casual labour	3	163	204877
	Remittances	4	89	85207
	Formal employment	5	69	603797

Table A12: Livestock purchases by group

Group	Type Of Livestock	Rank	Counts	Average Amount
Males	Chicken	1	22	6505
	Cattle	2	16	47500
	Pigs	3	11	10546
	Goats	4	6	14167
	Sheep	5	4	20000
Females	Ducks	1	10	17280
	Cattle	2	5	800
	Chicken	3	4	3000
	Sheep	4	2	8000
	Goats	5	2	15000
Both	Ducks	1	124	59746
	Chicken	2	61	35615
	Cattle	3	48	120096
	Goats	4	26	10946
	Pigs	5	11	27455

Table A13: Non food expenditures by group

Group	Item	Rank	Counts	Average Amount
Males	Clothes	1	1994	4495
	Medicines	2	1911	4977
	Education	3	1458	7574
	Levies	4	1321	3231
	Drink refreshments	5	919	13432
Females	Clothes	1	1994	3142
	Medicines	2	1911	2164
	Education	3	1458	4637
	Levies	4	1321	408
	Drink refreshments	5	919	1270
Both	Clothes	1	1994	28665
	Medicines	2	1911	23319
	Education	3	1458	37422
	Levies	4	1321	18533
	Drink refreshments	5	919	13645

Table A14: Food insecurity coping strategies

Strategy	Rank	Count
Casual labour	1	935
Buy from the market	2	527
Sell animals	3	474
Brewing	4	262
Use from store	5	181

Table A15: Production activities by gender

Activity	Rank	Counts	Group	Time Spent In Seasons	
				Dry	Wet
Planting	1	1801	Male	3.10	3.70
			Female	0.40	0.61
			Both	1.35	2.42
Land preparations	2	1749	Male	0.68	0.47
			Female	0.63	0.46
			Both	3.04	2.27
Harvesting	3	1451	Male	0.41	0.43
			Female	0.68	0.57
			Both	2.81	2.34
Weeding	4	1367	Male	0.48	0.84
			Female	0.42	1.11
			Both	1.77	5.14
Processing	5	933	Male	1.04	0.89
			Female	3.58	3.60
			Both	2.36	2.15

Table A16: Reproduction activities by gender

Activity	Rank	Counts	Group	Time Spent In Seasons	
				DRY	WET
Cooking	1	1622	Male	0.17	0.45
			Female	5.26	5.21
			Both	0.24	0.31
Fetching fuel	2	1390	Male	0.54	0.68
			Female	3.40	3.53
			Both	0.56	0.84
Fetching water	3	1367	Male	0.29	0.40
			Female	5.72	5.75
			Both	0.56	0.62
House keeping	4	1288	Male	0.21	0.21
			Female	5.66	5.67
			Both	0.38	0.47
Child care	5	1253	Male	0.13	0.22
			Female	5.81	5.71
			Both	0.58	0.66

4.2 Annex 2: List of projects and numbering used

Theme No.	Theme name	Project number as used in Database	Project code	Project title	No of questionnaires entered
1	Marketing of Crops	1	010	Commercialization of cassava root as a source of energy in commercial livestock feed	40
		2	022	Strategies for improving commodity market and information and market access by farmers and traders in the Eastern and Southern Highland zones in Tanzania	214
2	Marketing of Livestock and Livestock Products	3	027	Development and application of appropriate technologies for milk collection, processing and marketing by smallholder dairy farmers and traditional livestock keepers in the Eastern and Southern Highlands zones of Tanzania	106
		30	036	Development of appropriate intervention to enhance livestock meat marketing, preservation and consumption in rural areas of the Eastern zone	61
3	Dry Season Feeding	4	017	Improvement of dry season feeding for smallholder dairy production in Southern Highlands of Tanzania	48
4	Major Livestock Disease and Pests	5	016	Optimising milk production and quality in smallholder dairy sector through control of mastitis, improved management and reduced post milking microbial contamination	38
		6	130	Optimising of on-farm regimes for control regimes for controlling ticks and tick-borne diseases for smallholder farmers and traditional zebu cattle	37
5	Evaluation of Crop Varieties	8	021	Sweet potato germ-plasm maintenance and evaluation in the Eastern zone	118
		9	011	Soy <i>Glycine max</i> L0 Mernll variety evaluation for yield potential and utilization as human food in Eastern and Southern zones of Tanzania	91
		23	041	In – vitro micro – propagation for mass production of clean planting materials of desirable banana cultivars	61
		24	043	Verification of common bean varieties tolerant to low soil low soil phosphorous and acid conditions (low pH) in Imalinyi division, Njombe district	60
		25	033	On – station and on – farm evaluation of improvement pigeon pea varieties in the eastern zone	297

Annex 2: List of projects and numbering used (contd.)

Theme No.	Theme name	Project number as used in Database	Project code	Project title	No of questionnaires entered
6	IPM for Major Crop Pests and Diseases	10	018	Integrated management of Witch weed (<i>Striga spp</i>) in sorghum and maize based cropping system of the Eastern zone	153
		31	042	On – farm development and promotion of integrated disease management measures for rice yellow mottle virus disease control in Kyela district, Southern Highlands of Tanzania	67
7	Management Practices Livestock	11	024	Improved cattle productivity through strategic feeding and reproductive health control in smallholder herds in Eastern zone, Tanzania	122
		12	025	Development of farm-level technologies for improving productivity of small ruminants in Eastern	84
8	Post Harvest Losses, Including Storage and Preservation	13	019	Increasing the development value of fruits and vegetable by reducing post harvest losses through processing and preservation in selected villages in Morogoro and Iringa regions	65
9	Processing and Packaging Technologies for Farm Products	14	029	Development and promotion of improved processing, packaging and storage of sweet potato and cassava for diversification of use and commercialisation of value added under smallholder conditions	130
		15	020	Development, transfer and adoption selected fruit and vegetable processing and preservation developed at SUA and MAFS by smallholder farmers in the Eastern and Southern zones	78
10	Irrigation System and Water Harvesting	16	012	Assessment and promotion of rainwater harvesting (RWH) to overcome water shortage for domestic, livestock and plant growth in semi arid areas of Njombe district	34
		17	026	Design – management interaction in smallholder irrigation system. A case study of Usangu plains	63
11	Cropping Systems for Female Farmers	18	023	Integrated Rice improvement program for women farmers in Kilombero river basin, Morogoro, Tanzania	153
		28	032	Improving food and income security of female farmers through introduction of appropriate cropping system in selected villages of Morogoro	256

Annex 2: List of projects and numbering used (contd.)

Theme No.	Theme name	Project number as used in Database	Project code	Project title	No of questionnaires entered
12	Wood – lots and Improved Fallow for Soil Fertility	19	013	Agroforestry technologies for soil fertility improvement and wood production in semi arid – areas of Morogoro and Iringa	97
		26	040	Testing of improved fallow for improving soil fertility: the use of trees and shrubs that enhance the availability of soil phosphorous and firewood	483
		27	037	Improvement of soil fertility in coconut based farming through crop rotation in farmer fields	159
13	Farmer Organizations	20	028	Strengthening farmers’ accessibility to information input and market in Tanzania through existing and new forms of farmers’ organizations	138
14	Biodiversity	21	014	Development and dissemination of mushroom cultivation and preservation technologies at household and community levels in the Southern Highlands and Eastern zone, Tanzania	73
15	Draft Animal Power	22	039	Promotional of sustainable utilisation of draft animal technologies for the improvement of agriculture productivity for smallholder farms	165
16	Integrated Plant Nutrient Management	29	043	Evaluation of the effect of nitrogen and phosphorous application in conjunction with tillage and residue management of physical and chemical characteristics of soil, weed, microbial population and diversity and on yield of maize	46
17	Structural Adjustment on Input Subsidies	32	034	Impact of macro – economic policy reforms on agricultural productivity, food security and poverty in Tanzania: a case of the Southern Highlands zone	257
18	Human Nutrition	33	031	Development of nutritional guidelines diet improvement in Morogoro and Iringa regions	309
		34	035	Formulation of weaning foods for enhancing household food and nutrition security	49
19		35	044	Evaluation of soil tillage practice and organic mulch on yield of rice and cowpeas grown in sequence under lowland rain – fed rice culture in Kyela and Kilombero districts	87

4.3 Annex 3: Selected graphs by sub-project

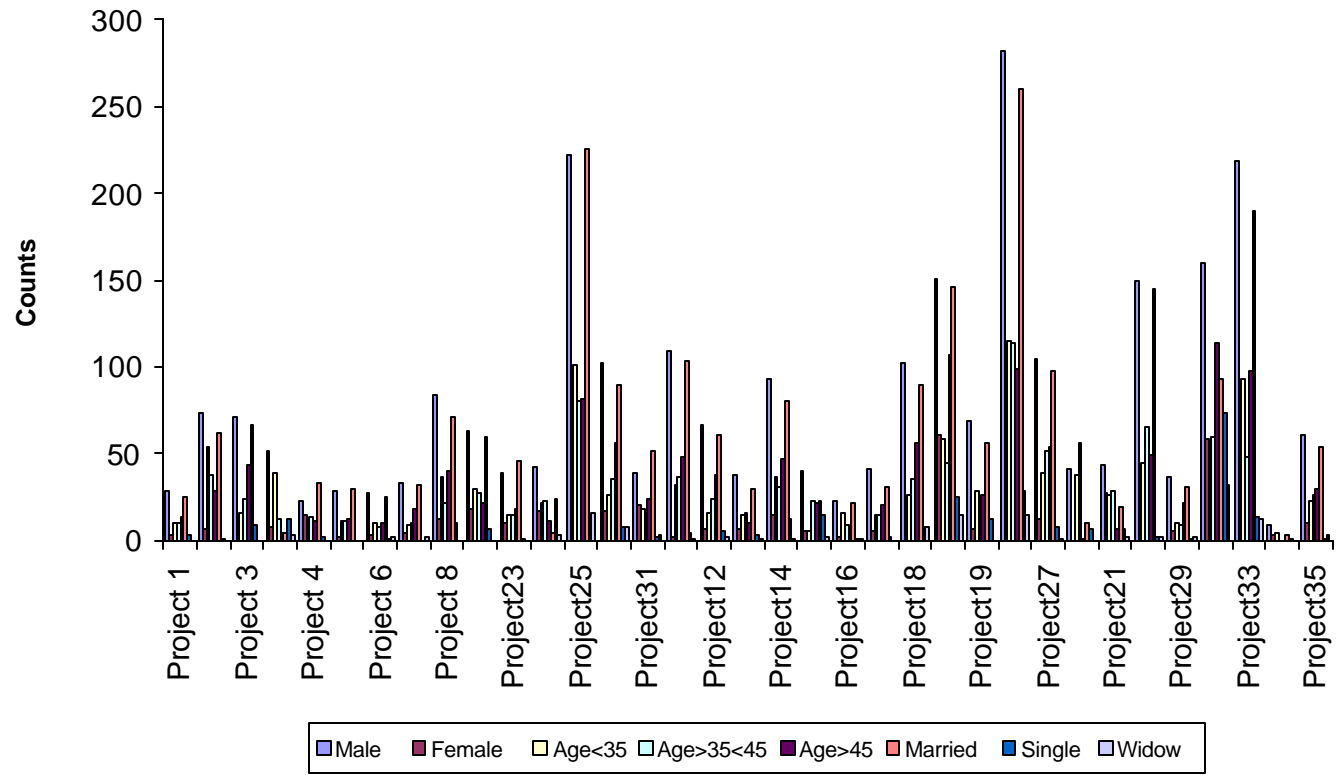


Figure A1: Gender, Age and marital status by household per project

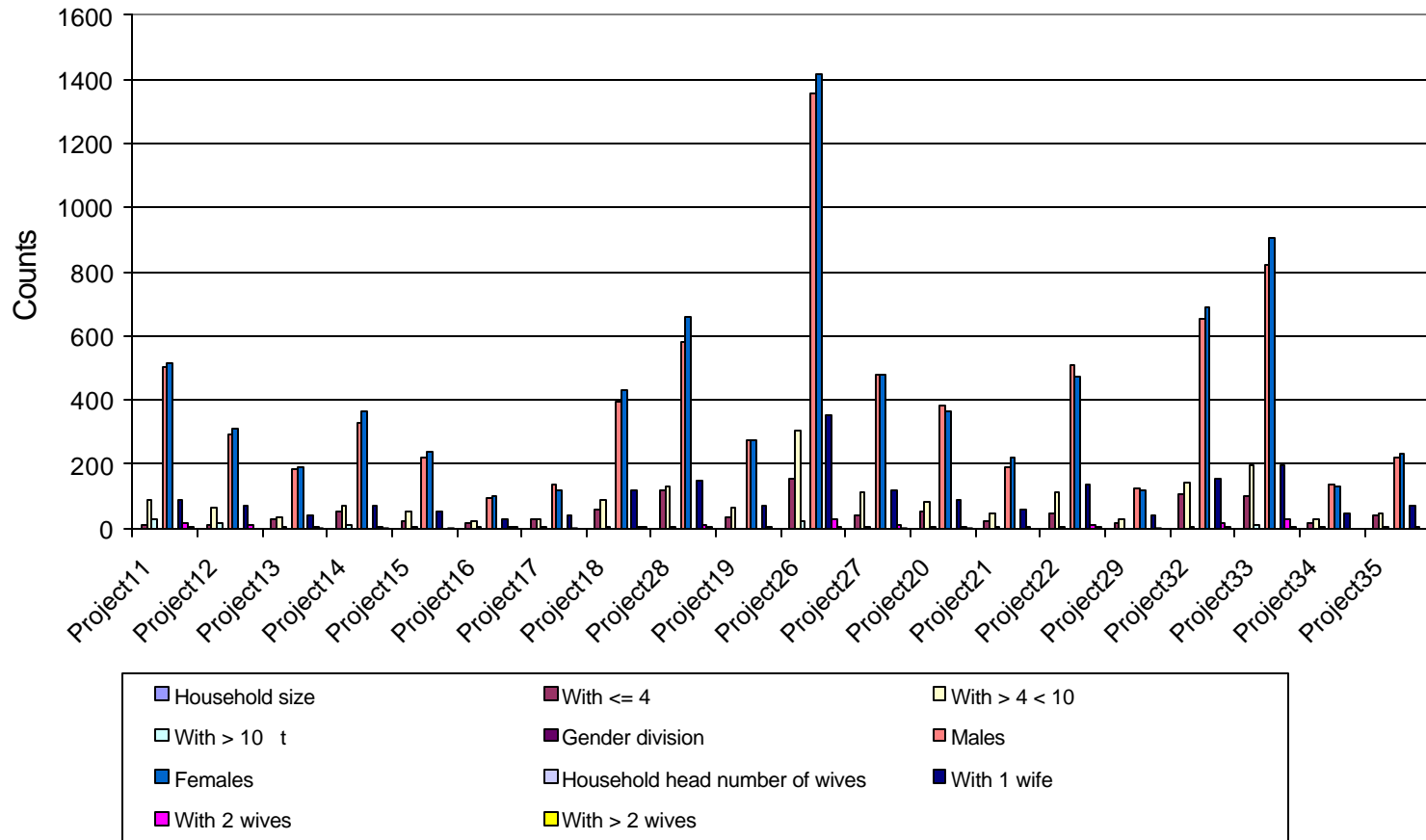


Figure A1: (continued) Gender, Age and marital status by household per project

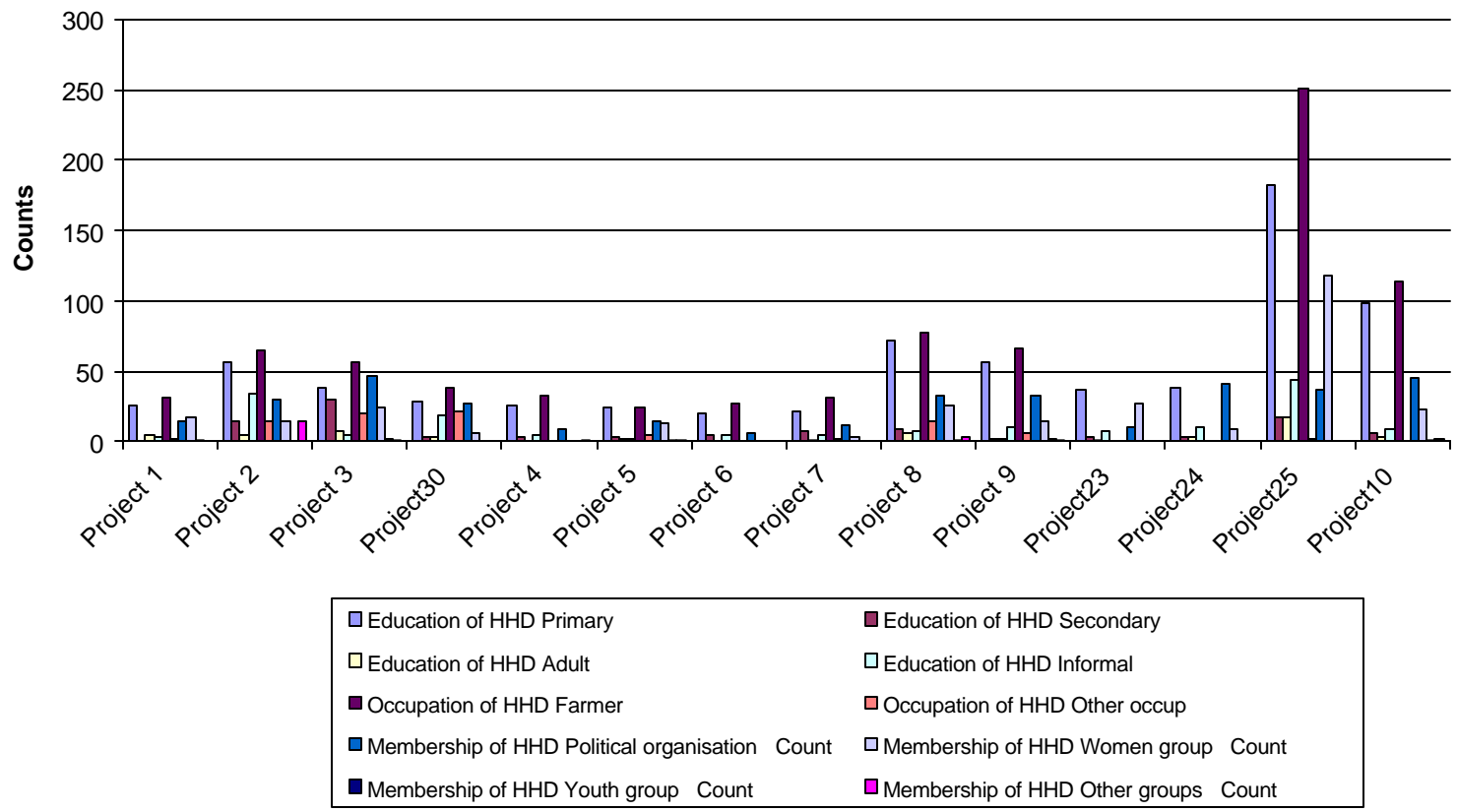


Figure.2.A: Education, occupations and membership in organisations of household

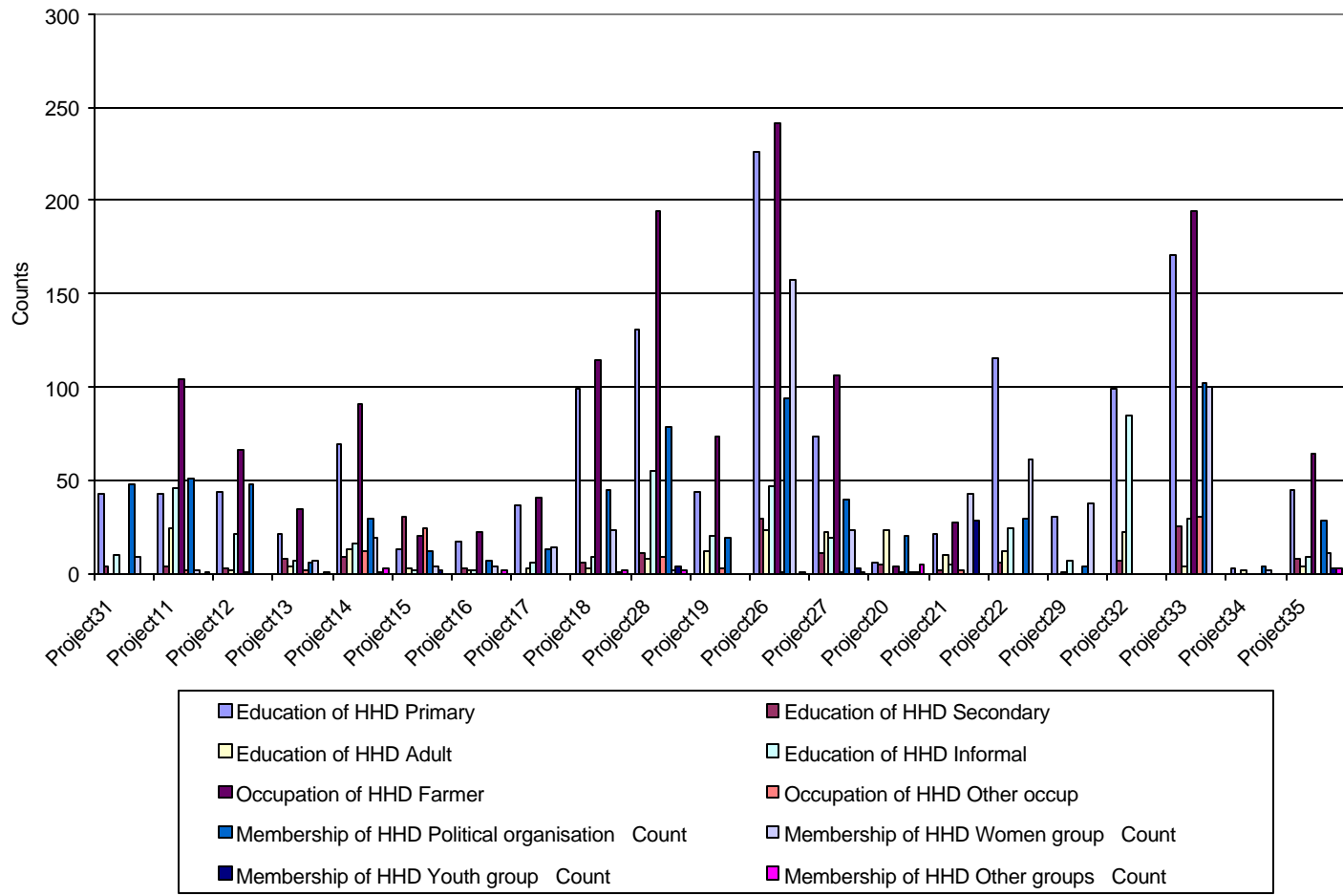


Figure 2A: Education, occupations and membership in organisations of household

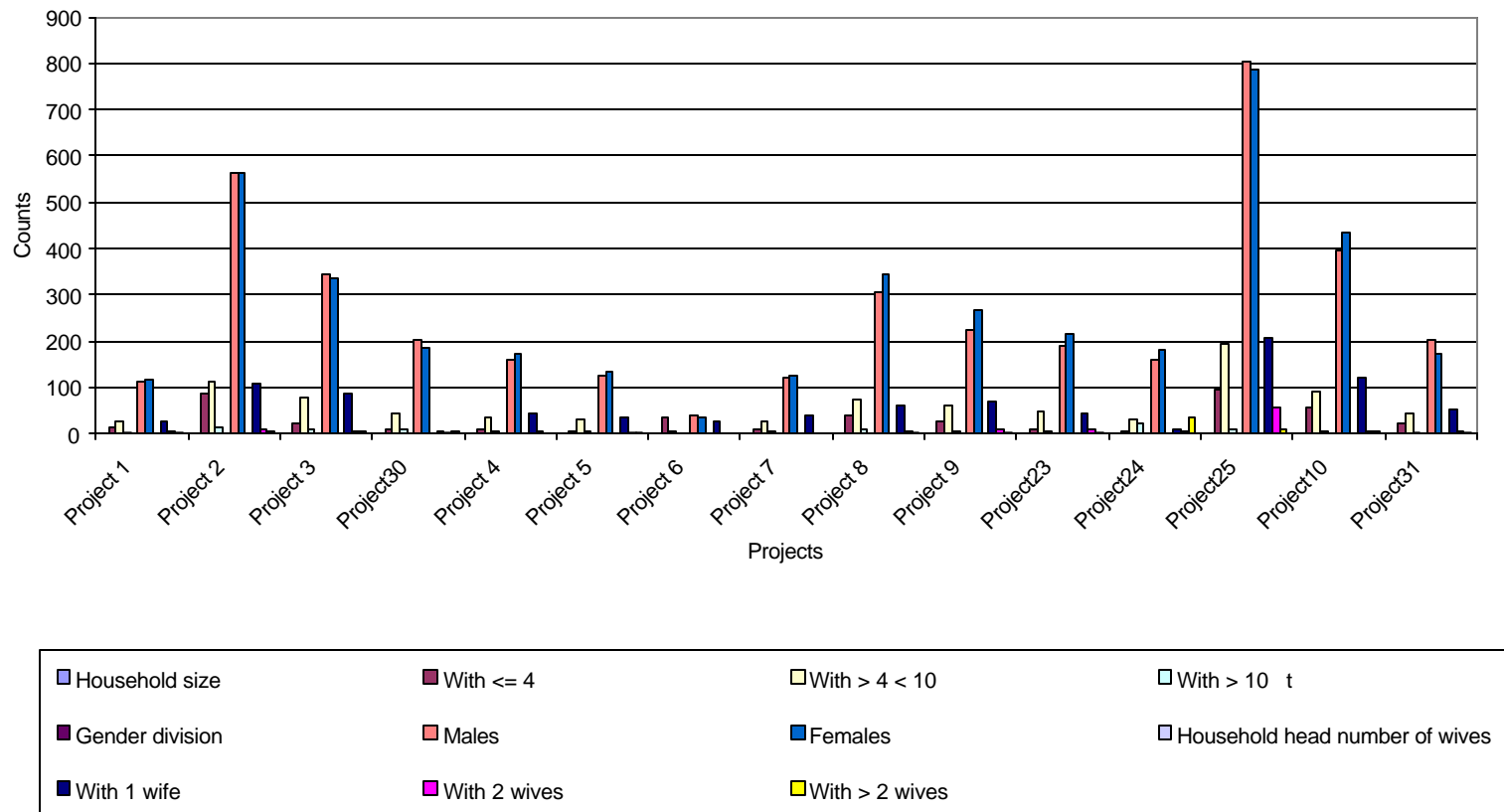


Figure 3A: Household size, gender division and number of wives

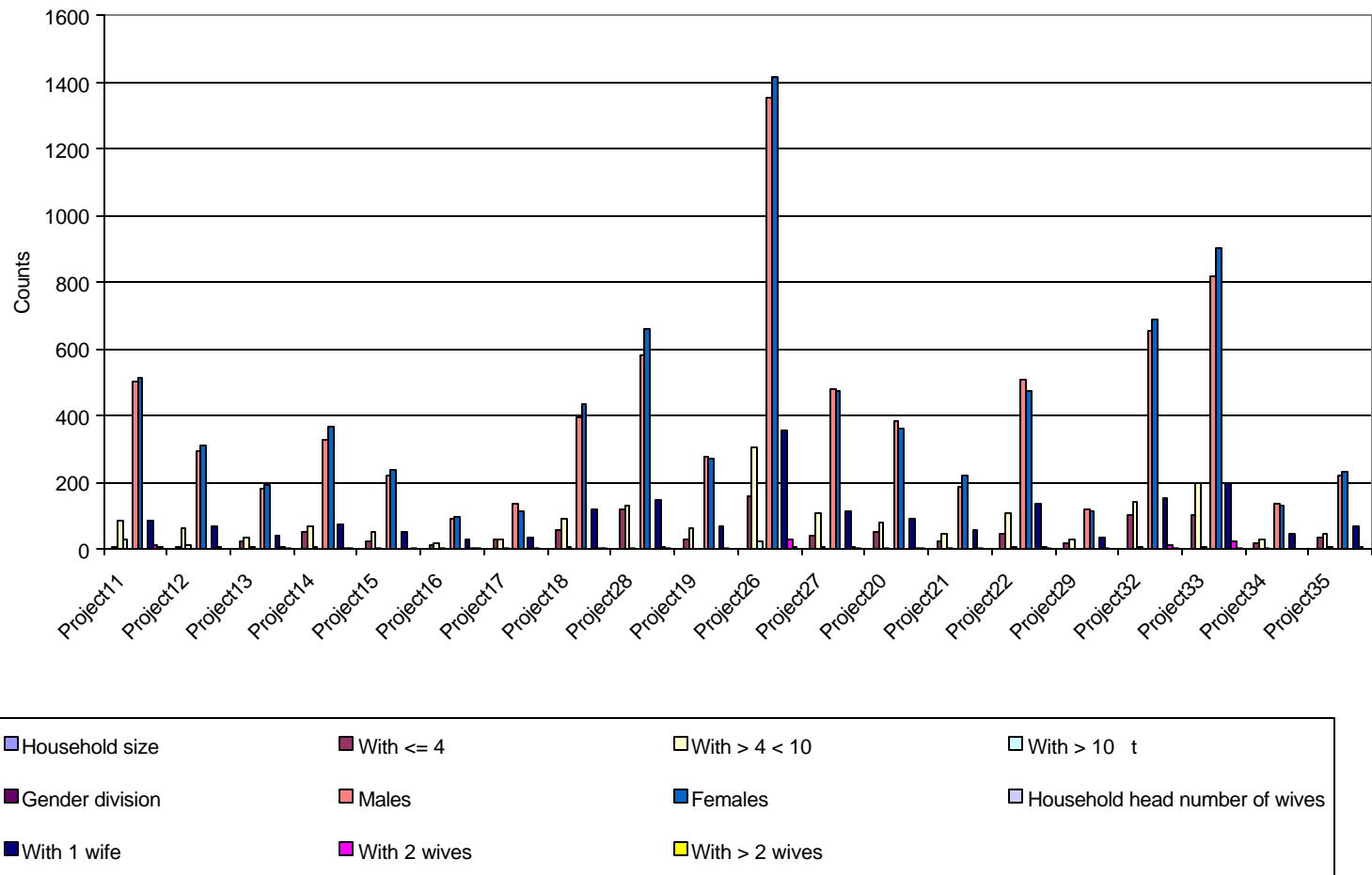


Figure 3A: Household size, gender division and number of wives