milk IT

Enhancing dairy-based livelihoods in India and Tanzania through feed innovation and value chain development approaches

Report of a livestock feed assessment in Lushoto District, Tanga region, the United Republic of Tanzania

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CIAT   ILRI   CGIAR RESEARCH PROGRAM ON Livestock and Fish   TALIRI   IFAD Investing in rural people

Summary

Feed assessment tool was applied in characterizing the production systems mainly related to feed innovation in Lushoto district. The villages involved were Ubiri and Mbuzii. The exercise was categorized into two sessions, namely, focus group discussions and individual interviews. A number of 73 (41 males and 32 females) participants (farmers) were involved in the focus group discussion and 24 farmers involved in individual interviews. Feeding practice dominate in both villages is cut and carry system. The key issue is low productivity potential of the animals which is an implication of lack of knowledge/skills on general animal husbandry and/or feed shortage mainly due to seasonality. This may possibly be a potential entry point for interventions in each village.

Characterization of the Livestock Production Systems and Potential for Enhancing Productivity through Improved Feeding in Ubiri and Mbuzii villages, Lushoto District – Tanga Region, Tanzania

1.0 Introduction

The study on characteristics of livestock production system in particular feed-related aspects was carried out in Lushoto District, Tanzania using the Feed Assessment Tool (FEAST) developed by Duncan et al. (2012). Lushoto District is one of the eight Administrative Districts of Tanga Region; others include Korogwe, Muheza, Mkinga, Handeni, Pangani, Kilindi and Tanga.

1.1 Geographical location of the District, infrastructure and natural resources

Lushoto District is located at about 450 km from Dar es Salaam, Tanzania and 32 km from the small town of Mombo at the major road of Dar es Salaam – Arusha. It takes about 45 minutes driving to reach Lushoto from Mombo town. Lushoto is situated in the Northern part of Tanga Region where Usambara mountains are found, within 4°25' – 4°55' Latitude South of the Equator and 30°10' – 38°35' Longitude East of Greenwich. The district shares borders with Same District in the north-west, Republic of Kenya in the north-east, and Korogwe District in the south. The District has a road network of 1,236 km, out of which only 32 km is tarmac (Mombo – Lushoto road), 169 km are Morram roads, and 1,035 km are earth roads. They all provide links between rural areas and urban centers in the district and beyond. There are different natural resources, which include forests, game reserves, and minerals. The scenic mountains, forests and game reserves offer good sites to attract both local and foreign tourists.

1.2 Agriculture and economic characteristics

Lushoto District depends purely on agriculture as the major livelihoods and the biggest employer of the majority (85%) of its people. It depends on subsistence agriculture, livestock keeping, forestry products (especially timber and bee-keeping) and tourism for its economy. However, crop production, livestock husbandry and forestry generate the main sources of income. The district is also endowed with a number of tourist attractions making tourism an important sector.

2.0 Methodology

2.1 Research Team

The research team consisted of 6 researchers (2 female, 4 male) from Tanzania Livestock Research Institute (TALIRI) – Tanga and 2 extension officers (1 female, 1 male) from Lushoto (Appendix 1). The actual sites for PRA differed between villages, in Mbuzii the sites were in primary school classes and in Ubiri were in farmers' home. The total number of participants was 73 (41 males and 32 females) and the individual interviewed farmers were 6 in each site (Table 1). Average time taken per PRA and individual interview together was 2 hours and 45 minutes, respectively. Selection of farmers for PRA was purposely for livestock keepers and for individual interview was based on wealth category of farmers (small, medium and large farmers).

Table 1: Number of participants and GPS coordinates of sites for FEAST exercise

Village	PRA Site	Number of participants	Males (no.)	Females (no.)	Village GPS coordinates	PRA Site GPS coordinates
Ubiri	Bangui	18	12 (4)	6 (2)	S 04° 51.440' E 038° 20.537'	S 04° 50.313' E 038° 19.560'
	Kiguzu	16	5 (3)	11 (3)		S 04° 49.472' E 038° 19.057'
Mbuzii	Group A	20	11 (3)	9 (3)	S 05° 05.335' E 039° 03.853'	S 04° 51.257' E 038° 20.094'
	Group B	19	13 (2)	6 (4)		S 04° 51.340' E 038° 21.093'

NB: in brackets are numbers of farmers of the interviewed with questionnaire

Ubiri

Mbuzii

Plate 1: Farmers during PRA in Ubiri and Mbuzii villages, Lushoto

2.2 Experience in applying the tool

- Poor time management by farmers- it took long before they all assembled in the venue (about 45 min after the scheduled time).
- Over expectation by farmers as most of them were ambitious that the exercise was for solving their existing problems and not otherwise.
- Some farmers were representative of the initially selected farmers hence failed to give out enough/true information required.
- Bias in farmers selection such that Muslim dominated which has implication on animal husbandry.
- Discussion dominated by men in Bangui and by women in Kiguzu.
- Farmers seem to have no knowledge on animal husbandry so couldn't give out enough information required.
- Feeds is a major problem in Mbuzii but was not mentioned out by farmers as a problem.
- Venue was good but interfered by student class periods (Mbuzii).

3.0 Results

3.1 Farm demographics

Farm and household sizes were averaged to 1 acre and 5 persons, respectively (Table 2), except in Kiguzu hamlet, average farm size was indicated to be much smaller. Labour is available throughout the year and highly required during the cropping season. The average cost of labour per day is Tsh. 4750/= and for cultivating one acre of land it is Tsh. 32,000/=.

Table 2: Farm demographics

Village	Location	Average farm size (acre)*	Household size
Ubiri	Bangui	1	5
Ubiri	Kiguzu	0.25	5
Mbuzii	Mbuzii A	1	5
Mbuzii	Mbuzii B	1	5

NB: 1 acre = 0.4 ha

3.2 Wealth classes in the villages

Large farmers were characterized by having more than 5 ha in all villages, while a small farmer had less than 2 and 3 ha in Ubiri and Mbuzii respectively. (Table 3)

Table 3: Wealth classes in Ubiri and Mbuzii villages, Lushoto District

| Category of farmer | Ubiri | | | Mbuzii | |
	Range of land size (ha)	Households falling into the category (%)		Range of land size (ac)	Households falling into the category (%)
Small	0.25 – 2	70		1 – 3	30
Medium	2.1 – 5	20		3.1 – 5	60
Large	> 5	10		5.1 – 10	10

3.3 Contribution of livelihood activities

Contribution of livelihood activities to household income is mainly from agriculture, however, livestock also shows to have potential contribution while other activities have minor contribution (Figure 1).
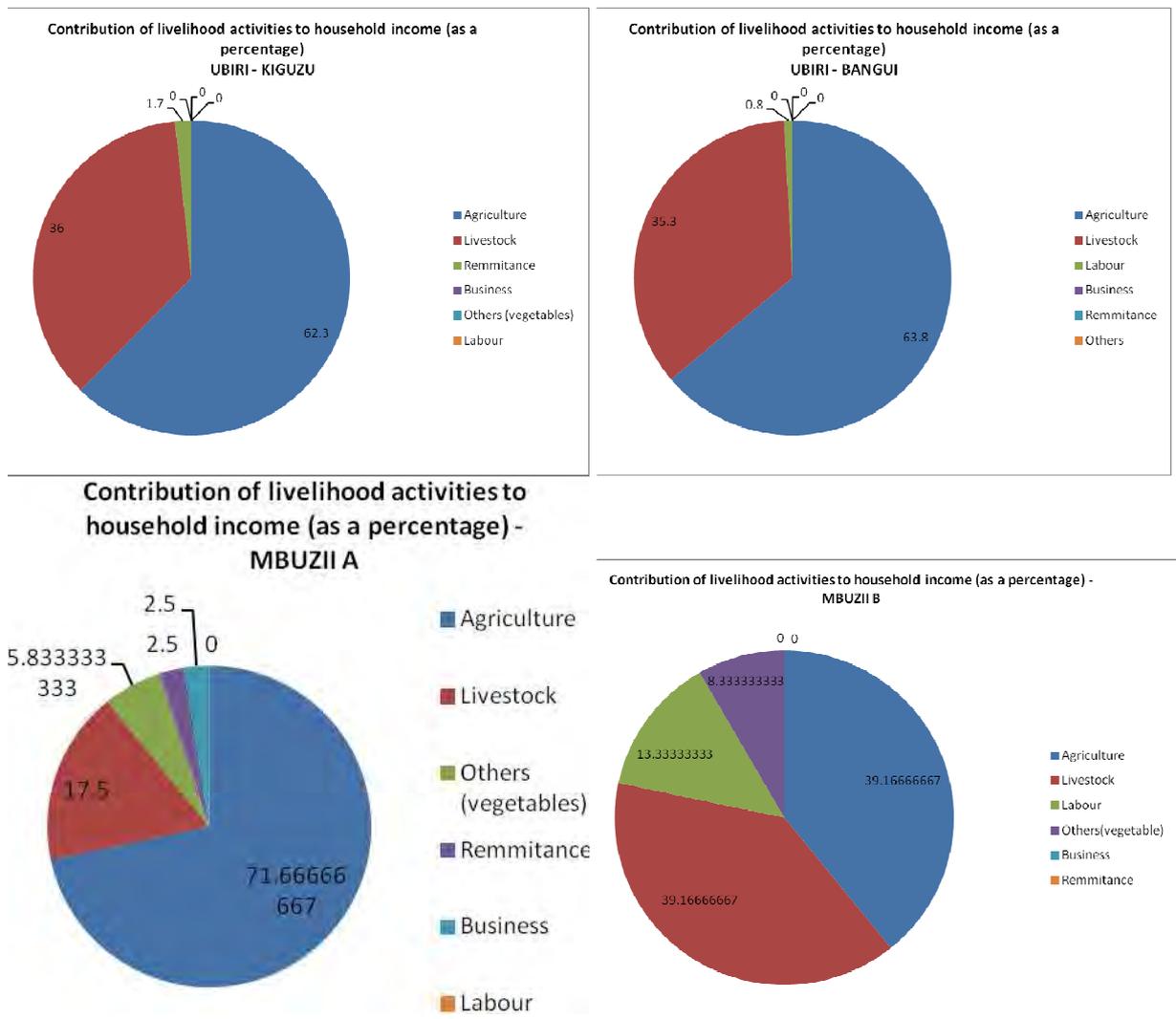
Figure 1. Contribution of livelihood activities to household incomes

3.4 Crops and cropping seasons

There are three cropping seasons in the area (Figure 2), named Mwaka or Masika (long rains), Vuli (short rains), Kiangazi (dry period). In some cases very short rains occur in some months, known as Chamazi (suitable for vegetable production). The perception of seasons was quite different within the two villages and also between them, except the core season for the long rains from February to May. This can indicate high variability in this particular area that could be explained by the topography of the Usambara Mountains.

Ubiri – Bangui

Name of season	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1. Mwaka		�	▓	▓	▓							
2. Vuli										▓	▓	▓
3. Kiangazi	▓											
4. Chamazi						▓	▓	▓	▓			

Ubiri – Kiguzu

Name of season	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1. Masika		▓	▓	▓	▓							
2. Vuli											▓	▓
4. Kiangazi	▓					▓	▓	▓	▓	▓	▓	▓

Mbuzii – A

Name of season	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1. Masika		▓	▓	▓	▓	▓						
2. Vuli										▓	▓	▓
3. Kiangazi	▓						▓	▓	▓			

Mbuziii – B

Name of season	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1. Mwaka	▓	▓	▓	▓	▓	▓	▓					
2. Vuli								▓	▓	▓	▓	▓
3. Chamazi						▓	▓					

Masika/Mwaka, long rains; Vuli, short rains; Kiangazi, dry season; Chamazi, season with very short rains suitable for vegetable production.

Figure 2: Cropping seasons

Different crops are grown during the cropping season, major ones being maize and beans; other crops include banana, cassava, sweet potatoes, pumpkins, tomatoes and vegetables for home use (Figure 3). The cropping areas for individual crops are particularly small in Ubiri. The grown crops are used both as a source of food and for income generation, and they are grown during the wet season, except for cassava which is grown during wet and dry seasons.

Irrigation is practiced by large per cent of farmers (60%) especially for vegetable cultivation. Usually, vegetables are grown after the end of the first rains. The available land is used for more than one crop per year and multiple cropping is done mainly for maize and beans. Fallowing is not commonly practiced.
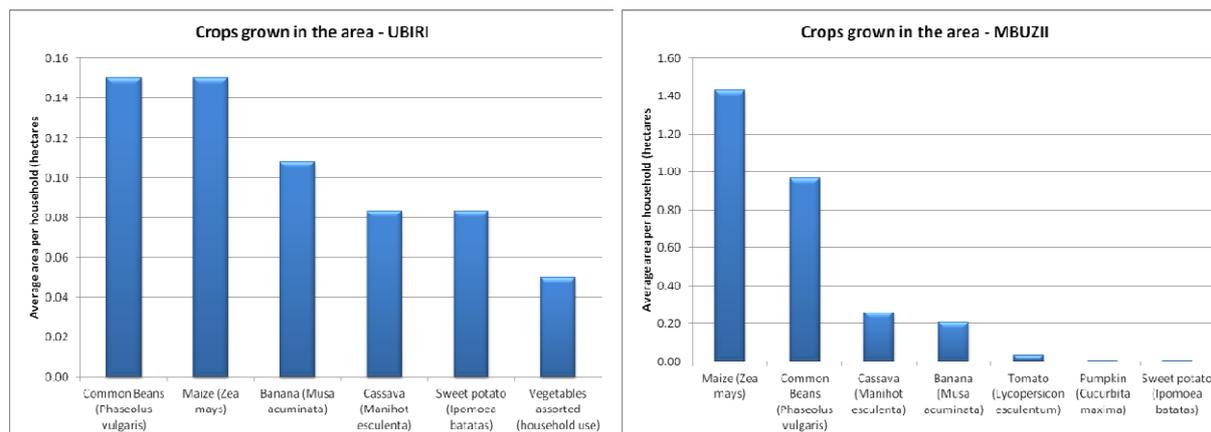
Figure 3: Crop grown in the area (dominant crops)

3.3 Livestock and livestock systems

Livestock species raised in the area include local dairy cows, improved dairy cows, sheep, goats and poultry-village condition (Table 4). All livestock species are mainly used as a source of food and income. Other use includes provision of manure and for paying bride price. Summary of the proportions of household that own the species and average number of animals in all villages is shown in Table 5.

Management of animals is as follows;

- Zero grazing is practiced, applying the system of cut-and-carry of fodder. Few farmers (20%) have good sheds for their animals, i.e. shades made of timber, concrete floor and iron sheets. Others (80%) tie their animals and feed them under a tree during the day and confine them in the family house in the evening.

- Natural suckling is applied to calves for an average period of 5 months and de-worming is done after every 3 months.

- Records are kept by only few farmers (20%), the type of records are mating and birth records.

Main diseases highlighted by farmers include ECF and Anaplasmosis; prevention/control and treatment is done by livestock extension officers. Other diseases include babesiosis, heart water, trypanosomiasis, mastitis and worm infestation. The treatment cost for ECF is Tsh.50,000/= and Tsh. 15,000/= for anaplasmosis. However, cost of treatment depends mainly on type and severity of the disease.

Bulls are commonly used for reproduction because of higher costs of semen and need for repeated services, when using Artificial Insemination (AI) that is only used by few farmers (10%). The price of semen is Tsh. 15,000/= per service, while with natural mating is Tsh. 7,500/= per conception.

Improved bulls are used in natural mating at a bull: cow ratio of 1:10. When AI is applied it is normal to have at least two repeats and the same amount of Tsh. 15,000/= is charged per each service.

Although majority of cows are improved (crossbred) dairy cows, the average milk production per cow per day is only 4 litres. This could be due to poor management of these animals. Production from local dairy cows is 2 litres per cow per day. Milk is normally sold with very little (1 litre) being left for home use. Average price of milk is Tsh. 500/= per litre; and live animal prices of cattle, sheep and goats on average are Tsh. 600,000/=, 50,000/= and 70,000/=, respectively.

Table 4: Proportions of household that own the species and average number of animals

Ubiri - Kiguzu

Livestock species	Proportions of household that own the species (%)	Average No. of animals per household
Local dairy cows	10	3
Improved dairy cows	55	2
Sheep	30	2
Goats	50	2
Poultry-village condition	100	10

Ubiri - Bangui

Livestock species	Proportions of household that own the species (%)	Average No. of animals per household
Improved dairy cows	95	2
Sheep	30	2
Goats	20	3
Poultry-village condition	100	15

Mbuzii - A

Livestock species	Proportions of household that own the species (%)	Average No. of animals per household
Local dairy cows	50	3
Improved dairy cows	70	3
Sheep	40	3
Goats	70	10
Poultry-village condition	100	20

Mbuzii B

Livestock species	Proportions of household that own the species (%)	Average No. of animals per household
Local dairy cows	50	2
Improved dairy cows	25	2
Sheep	5	2
Goats	80	7
Poultry-village condition	100	20

Table 5: Summary of estimated proportions of household that own a livestock species and average number of animals (range in brackets)

Livestock species	Proportions of household that own the species (%)	Average No. of animals per household
Local dairy cows	53 (10-95)	16 (2-30)
Improved dairy cows	60 (25-95)	3 (2-3)
Sheep	23 (5-40)	16 (2-30)
Goats	50 (20-80)	8 (3-12)
Poultry-village condition	50 (0-100)	33 (15-50)

3.4 Feeds and feeding systems

3.4.1 Availability of feed resources

Naturally occuring green forage and collected feeds are the primary component of the feed base within this area throughout the year, although they are sometimes obtained as far as 20 km away from the homeland. They contribute the largest proportion of the feed in all villages based on a dry matter (DM) basis, metabolizable energy (ME) and crude protein (CP) (Figure 4).

Maize gluten with bran is the only used purchased feed resource in the area, although its dietary contribution is negligible (Figure 5).

Other sources are from cultivated fodder and crop residues. Feed processing e.g. chopping is applied by the majority of farmers (60%), only 10% practice molasses or salt treatment of the feed and supplementation with maize bran is done by few farmers (30%).

Seasonality of feed availability is the case in the area; high abundance is during long rains and less abundance during dry periods (Figure 5), nevertheless there does not seem to be extreme shortage in the latter.
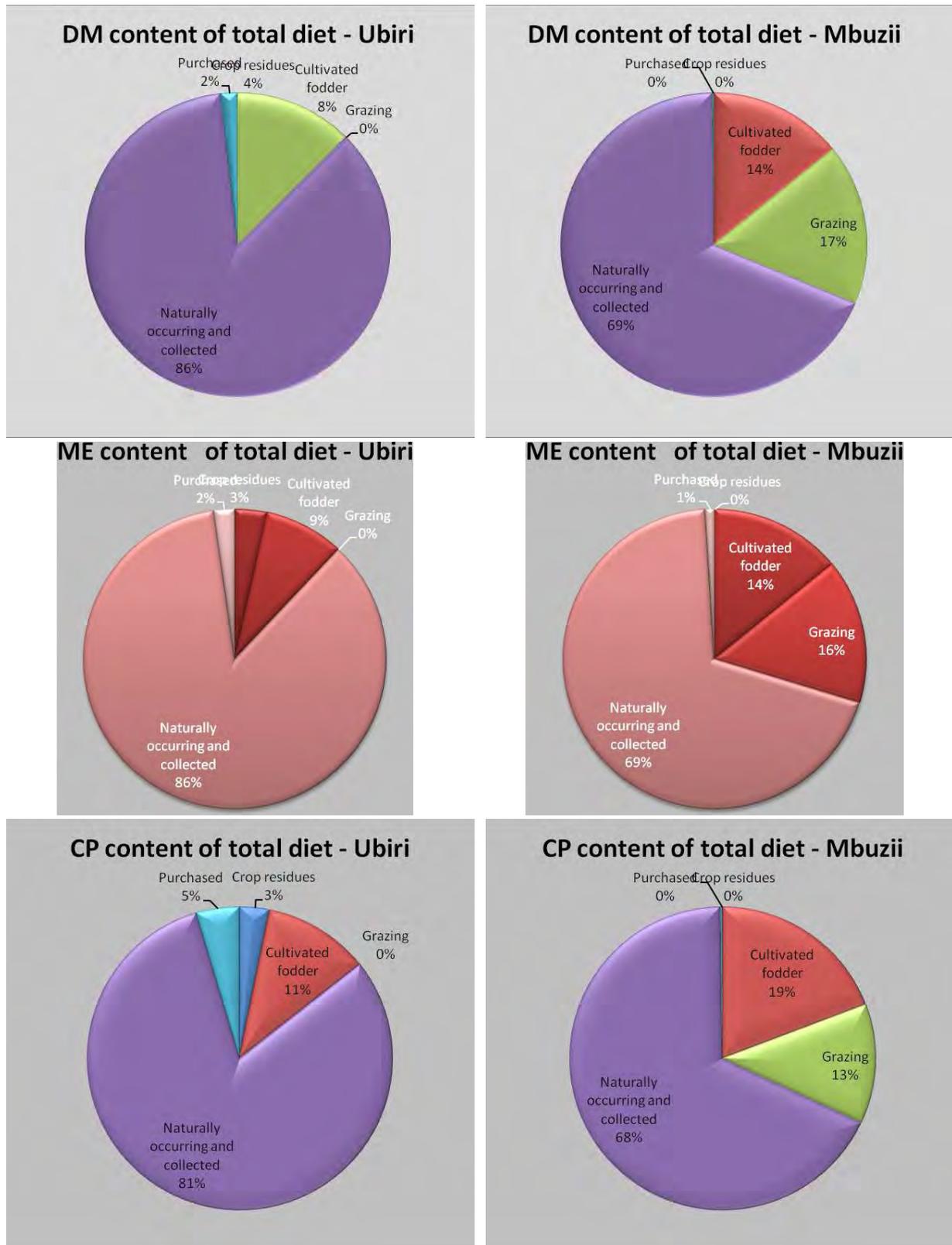
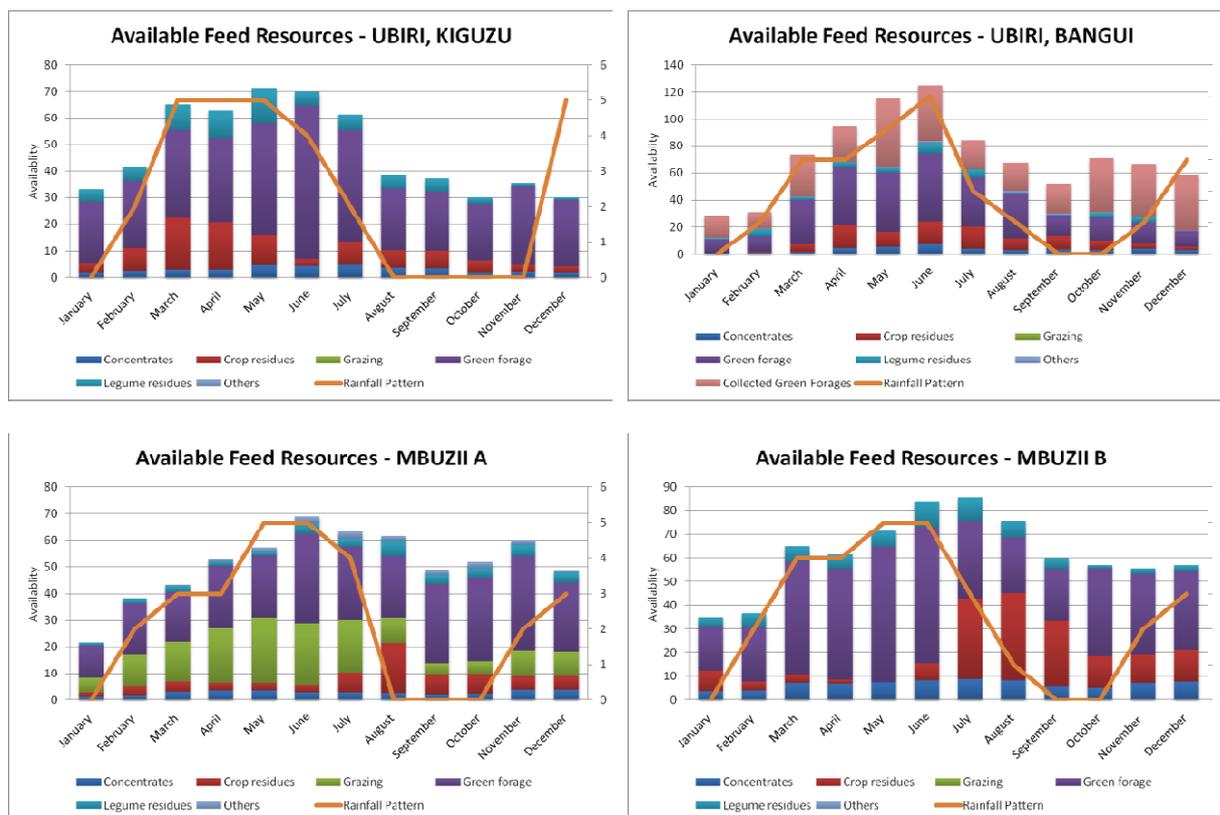**Figure 4:** Available feed resources in the study area

Figure 5: Available feed sources utilised by farmers throughout the year

3.5 Agricultural and livestock inputs and services

Agricultural inputs are too expensive when available, however, in some cases they are available, subsidized by the government from government subsidy (e.g. after every 3 years). Livestock inputs are available from local sellers in the nearby area (about 10 km away). Credit providers (BRAC and VICOBA) are available in the area but do not offer credits for crop/livestock production. Extension services are available in the area and always reach farmers. They are responsible for provision of advice in livestock production including prevention/control and treatment of diseases, also provision of AI services.

3.6 Constraints and opportunities

3.6.1 Constraints/problems

The major five problems in their descending order of importance as identified by farmers and their proposed solutions are given in Table 6.

Table 6: Pair wise ranking of identified problems and proposed solutions by farmers during PRA

Site	Problem	Solution
Ubiri-Bangui	High costs of treating animals	Actual treatment costs to be known
	Low genetic potential of the breeds	Information on source of improved breeds and education on identification of good breeds
	Livestock diseases	Education on proper animal husbandry
	Low milk price	Group formation and setting up price
	Poor housing	Education on animal husbandry
Ubiri-Kiguzu	Poor housing	Provision of training on general animal husbandry
	Low genetic potential of the breeds	Provision of improved bulls (Government/stakeholders to assist), use of AI.
	Milk market – too far	To have a collection centre in the area
	Lack of education on animal keeping.	Capacity building to famers in livestock training institute.
	Poor heat detection	Provision of training on general animal husbandry including proper heat detection.
Mbuzii-A	Lack of farmer education on animal husbandry	Provision of farmer trainings on animal husbandry
	Low genetic potential of the breeds	Provision of improved bulls (Government/stakeholders to assist)
	Limited number of livestock extension officers	Government to employ enough livestock extensionists.
	Unavailability of veterinary drugs	Group formation and have a centre for selling veterinary drugs
	Lack of water	Improve irrigation on schemes
Mbuzii-B	Lack of knowledge on animal husbandry	Farmers training on general animal husbandry
	Low genetic potential of the breeds that are kept	Provision of improved bulls with subsidized prices
	High price of veterinary drugs	Identification of medicinal plants to be used as an alternative to veterinary drugs
	Unavailability of dip tank	Construction of dip tank in the village
	Feed scarcity	Introduction of improved pastures

Table 6: Summary of the major problems and proposed solutions

SN.	Problem	Solution
1.	Low genetic potential of the breeds	Information on source of improved breeds and education on identification of good breeds. Provision of improved bulls (Government/ stakeholders to assist), use of AI.
2.	Lack of education on animal keeping	Provision of training on general animal husbandry (Government/stakeholders to assist)
3.	Livestock diseases and higher costs of treating animals	Education on proper animal husbandry, actual treatment costs to be known, construction of dip tank in the village
4.	Low milk price, and too far milk market	Group formation and setting up price, to have a collection centre in the area
5.	Poor housing and lack of water for irrigation	Provision of training on general animal husbandry, improve irrigation on schemes

3.6.2 Opportunities

- Availability of extension staff to provide livestock services to farmers, i.e. AI services, prevention/control and treatment of diseases and advisory services on farmers' group formation.
- Availability of milk processing industry in Tanga

3.7 Conclusion and Recommendations

The exercise revealed that livestock keeping contributes much to the income of the farmers in the study area; therefore, the following was concluded;

- Although feed was not mentioned as a direct problem by farmers in both villages, long distance walking for forage collection indicates feed unavailability especially during dry season.
- Feed conservation is not practiced by farmers, hence, there is feed shortage especially during dry periods.
- Low productivity potential of the animals is an implication of lack of knowledge/skills on general animal husbandry and/or feed shortage mainly due to seasonality.

The following was recommended

- Farmers need to be trained on general animal husbandry. Government and other stakeholders are required to take an integrated approach to improve livestock extension services and provision of education to farmers through short courses, seminars, workshops. Emphasis should be put in the importance of feeds and feeding.

References

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Appendix
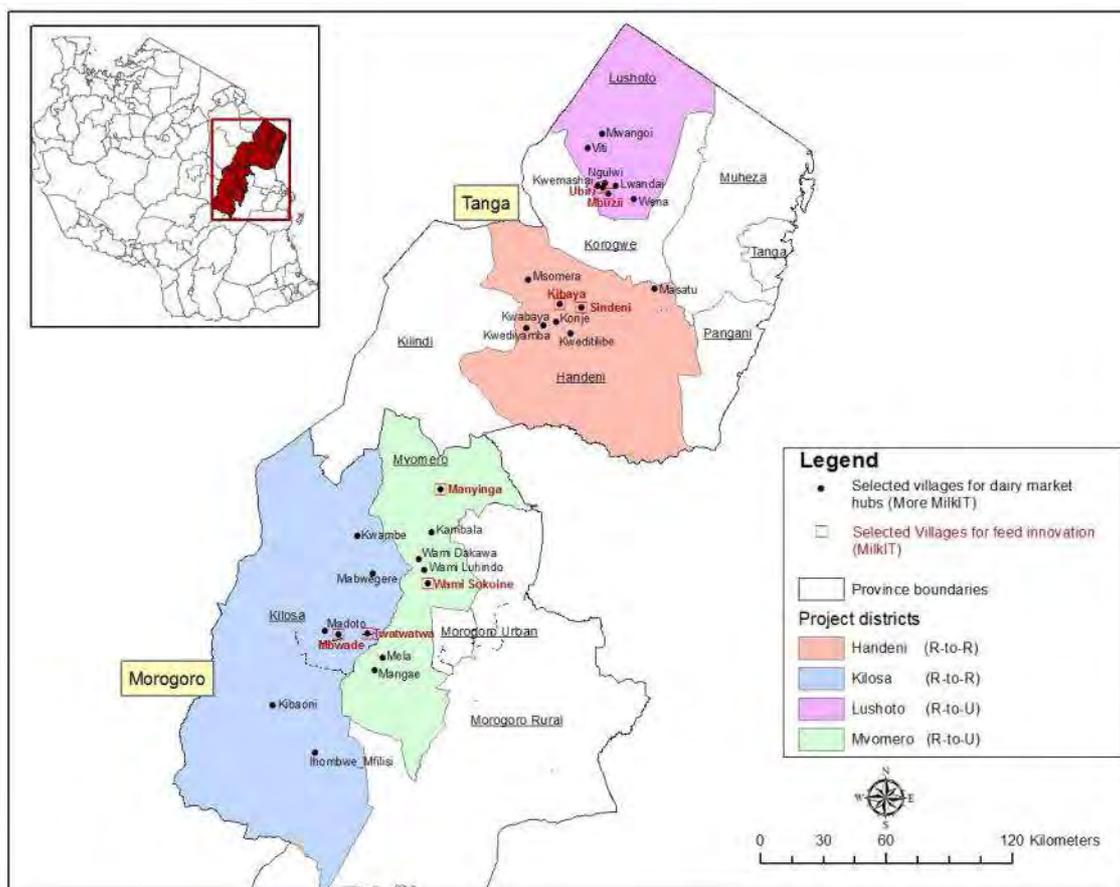
Appendix 1 Map: MilkIT project sites in Morogoro and Tanga Regions of Tanzania; map produced by ILRI.

Appendix 2: The research team for FEAST exercises

Name	Gender	Institution, function
Rose Loina	Female	TALIRI, Livestock Research officer
Samwel Mngulu	Male	TALIRI, Livestock Research officer
Walter Mangesho	Male	TALIRI, Livestock Research officer
John Diyu	Male	TALIRI, Livestock Research officer
Jelly Chang'a	Female	TALIRI, Livestock Research officer
Valentino Urassa	Male	TALIRI, Livestock Research officer
Anna Temu	Female	Lushoto District Livestock Office, Extension officer
Francis Hiza	Male	Lushoto District Livestock Office, Extension officer

Appendix 3: Acronyms and abbreviations

AI	Artificial insemination
CBPP	Contagious Bovine Pleuropneumonia
CP	Crude protein
CIAT	International Center for Tropical Agriculture
DM	Dry matter
ECF	East Coast Fever
FEAST	Feed assessment tool, see http://www.ilri.org/feast
IFAD	International Funds for Agricultural Development of the United Nations
ILRI	International Livestock Research Institute
ME	Metabolizable energy
MilkIT	A research project funded by IFAD (Title: *Enhancing Dairy-based Livelihoods in India and the United Republic of Tanzania through Feed Innovation and Value Chain Development Approaches*)
NBS	National Bureau of Statistics
PRA	Participatory Rural Appraisal
SUA	Sokoine University of Agriculture, Morogoro, Tanzania
TALIRI	Tanzania Livestock Research Institute
Tsh.	Tanzanian Shilling; about 1600 Tsh. = 1 USD at the time of the survey