Lessons Learned in Tanzania from Site Selection Process

By

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December 2015

Introduction

The Tanzanian government is facilitating the development of the pro-poor informal sector through interventions aimed at integrating dairy sector into structured milk value chains. This development seeks to increase the country's milk production to meet an increasing demand for milk caused by rapidly growing urban populations (Nkya et.al, 2007; Hayes, 2011). In line with this government initiative, the East Africa Dairy Development (EADD) phase II was launched in Tanzania in 2014. EADD II is a five year project designed to help 35,000 smallholder farm families in Tanzania to achieve sustainably improved livelihood as well as stimulate income growth for an additional 200,000 secondary beneficiaries by 2018. EADD II is a continuation from the pilot phase of the project (EADD I) which was implemented between 2008 and December 2013 in Kenya, Uganda and Rwanda. Newly initiated in Tanzania, EADD II is being implemented in the Southern Highlands milk shed which covers Iringa, Njombe and Mbeya regions.

The first step of the project's implementing required a careful, robust and informed site selection process in order to ensure that the project objectives are achieved. A site selection protocol was developed in phase I of the project to guide the selection of suitable sites where the project would be implemented in each country. At the start of the second phase of the project (EADD II), the project team in Tanzania, following the laid–down protocol, undertook a series of assessments to identify new sites for the project interventions.

The site selection process was conducted in three stages which included: scoping, prefeasibility and feasibility assessments, in order of occurrence. The scoping exercise was intended to identify and map out areas with potential for milk production using secondary information. Prefeasibility exercise assessed the potential for EADD II interventions in sites identified during the scoping exercise while the feasibility study assessed the practicality of implementing EADD's hub approach in sites that were considered to have better potential from the prefeasibility study. The feasibility study assessed several aspects of feasibility including financial and economic viability.

The Southern Highland milk-shed which covers Mbeya, Njombe and Iringa regions were earmarked at proposal development stage as the most potential areas for project implementation in Tanzania. The objective of site selection for EADD II was to identify and select nine (9) viable sites where dairy hubs would be established. A total of 127 sites were identified (47 in Mbeya, 44 in Iringa and 36 in Njombe) during the scoping exercise. Based on available secondary data including cattle densities and milk production volumes from district cattle census data and district milk volumes, 29 sites out of the 127 sites were deemed as potential sites. The 29 sites (9 in Njombe, 10 in Mbeya and 10 in Iringa) went through prefeasibility assessment and were subjected to a more in-depth quantitative analysis of indicators that were identified as important in collective dairy marketing and the establishment of a dairy business hub. The results of the prefeasibility analysis concluded that 18 of the 29 sites were potentially viable. The 18 sites underwent an elaborate feasibility study to assess their economic viability and other aspects of feasibility assessment. From the feasibility assessment, which constituted the final evaluation of the sites for site selection, 10 sites (3 in Njombe, 4 in Mbeya and 3 in Iringa) were deemed viable and hence selected as project sites for implementation. After the sites had been selected, a baseline study was conducted in all the 10 sites to provide data on the project indicators against which progress would be measured during and after the project life time.

This paper therefore seeks to assess the robustness of the site selection process. We compare the findings from the datasets that were generated during the site selection process and from the baseline survey in order to draw conclusions as to whether the assessments conducted during the site selection process would have led to the same conclusions as the more empirical baseline survey in regards to site characteristics and therefore, the suitability of the sites for project implementation. The findings of this investigation would therefore lead to a conclusion as to the strength of the site selection's assessment in guiding the selection of suitable sites for project implementation.

Methodology

Data sources and analysis

Data from two distinct sources, site selection process conducted between June and August 2014 and EADD II baseline survey conducted in December 2014, were used in this study. Data from site selection composed of the data obtained during prefeasibility and the feasibility studies. Site selection data was collected from focus group discussions with key informants in the respective sites. The key informants included district production officers, district veterinary officers, officials from cooperatives, local council leaders and private actors along the dairy value chain within the respective sites. These key informants made references from several documents and reports which included: local government production department reports, cooperative records and livestock census reports. During the discussions, responses would be entered into excel templates pre-designed prior to generate sites scores based on the responses captured.

Baseline survey data, on the other hand, were collected from a sample of cattle-keeping households randomly selected from a radius of 15km from the site where the proposed EADD-supported dairy hub would be established in each of the 10 sites, using geo-spatial random sampling. Using the project's key performance indicators (i.e. milk production and profit from dairy farming) as the response variables in sample size estimation, a total of 580 households were sampled and interviewed. The sample was generated using probabilistic random sampling at household level such that every cattle keeper has an equal chance of being included in the survey. A geospatial tool was used to demarcate the study sites, generate the random sample of points where sampled households would be located and generate maps and GPS coordinates for locating the sampled points in bid to successfully locate sampled households. Baseline data were collected at household level through personal interviews using a structured questionnaire.

In this study, the data from the baseline survey were assumed to be the gold-standard i.e. highly dependable and empirical while the data from site selection, used as the screening test, are taken to be more subjective hence low in terms of dependability.

With the main objective of the study being to test whether site selection process and data led to the selection of best sites suited for EADD implementation, the study involves identifying comparable variables from both datasets. Comparable variables were first identified and assessed in respect of their appropriateness for this study based on the study objective and their appropriateness in the implementation of EADD's hub model approach.

Data on the selected comparable variables from both data sets were summarized in forms of percentages, means and frequencies. Comparisons between these descriptive statistics from the two data sets were done in order to assess whether the two datasets differed significantly. For continuous variables, means from both datasets were estimated and deviations between means from both data sets would be computed as illustrated in equation (1).

$$\text{Deviation} = M_{ss} - M_b \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Where M_{ss} is the mean from site selection and M_b is mean from the baseline for the same variable. The magnitude of the "*Deviation*" was then compared with the standard deviation (SD) of mean estimates from the baseline since baseline data was taken to be more empirical and hence dependable compared to site selection data. If |Deviation| > Mean SD, then the 2 means would be considered to be significantly different; otherwise they would be taken to be within the same ranges, implying site selection and baseline would have arrived at the same conclusion in regards to the variable in question.

For categorical variables, percentages and frequencies were estimated. A difference in percentages less than 10% between the 2 datasets was considered too low to justify a conclusion that there are significant differences in results between baseline and site selection.

Variables considered in the study

While the baseline survey study gathered data on various farmer, farm and other external characteristics of the households in the study sites, only variables that are comparable in the two studies i.e. both site selection and baseline survey, have been used in this study. Table 1 presents a list and a summary description of the variables used in the study. More elaborate discussion regarding the variables can be found in Appendix 1.

Table 1: Variables used in the study

No.	Variable	Description
1.	Productivity per cow	The amount of milk produced per cow per day
2.	Cattle breed-type	Dairy cattle kept by famers, either local, cross or exotic
3.	Herd size	Number of cattle kept per farmer
4.	Primary economic activity of the household head	The activity that is considered as a major source of income for the household
5.	Feeding systems	The mode of keeping cattle i.e. whether extensive or intensive
6.	Fodder cultivation	Availability of improved cattle forages on the farms
7.	Gender	Women and men participation in dairy activities at household level as well as decision on proceeds from milk sales.

Results and Discussion

This section provides the results of the analyses and discusses the implications of the results with respect to the robustness of the site selection process i.e. whether the assessments conducted during the site selection process would have led to the same conclusions as the more empirical baseline survey. The analysis here is based on site characteristics, from which the conclusion on suitability of the sites for project implementation was drawn. The subsections are organized as research questions, each answering a question regarding specific variables assessed in the study.

1. **Did the site selection assessment sufficiently inform the project on primary economic activity?**

Since EADD II is a dairy project, whose main objective is to improve the productivity and incomes of smallholder farmers through milk production and marketing, cattle-keepers are the main target group for the project. In order to understand the key economic activities in the sites, key informants were asked whether dairy was a key source of income for families living in the sites' catchment areas. On the other hand, baseline survey respondents were asked to specify the primary economic activities from which they derive their livelihoods. Table 2 presents the findings on whether dairy farming was a key source of livelihood/income in the 10 sites that were selected for the project intervention.

Table 2: Primary Economic activity

Hub	Feasibility; dairy is the source of livelihood	Baseline: % of HH reporting farm management as primary activity
Mviwambo	Yes	95
Ilembo	Yes	98
Kyimo	Yes	88
Isange	Yes	87
Igima	Yes	98
Kichiwa	Yes	96
Uwemba	Yes	84
Igowole	Yes	79
Ifunda	Yes	86
Mtitu	Yes	82

In general 517 out of 579 baseline survey respondents (89.3%) indicated farming as their major source of livelihood. As a characteristic of smallholder farming system and noting that only cattle-keeping households were sampled for the baseline survey, these farm families practiced mixed crop and livestock farming. Consequently, farming as an activity comprises all agriculture and livestock related activities. Likewise from feasibility, all hubs reported dairy farming as their major source of revenue. (Appendix 1 gives detailed distribution primary activities for each hub). The results in Table 2 reveal that the baseline results are in agreement with the feasibility study results in terms of the primary economic activities in the sites. Therefore, the results from the baseline survey would have led to the same conclusion as the site selection assessment regarding the primary economic activities in the 12 sites.

2. Did site selection assessment sufficiently inform on cattle types, herd sizes and productivity?

One of the project's key outcomes is improving milk production and productivity. Milk production per cow is a function of many aspects including cattle breeds, types and herd size. Among other productivity enhancing technologies, the project aims at improving milk production through breeding in order to produce superior cattle genotypes with higher production potential. It was therefore important to identify the cattle types kept in the different sites to inform project interventions and priorities in terms of cattle breed improvement.

On the other hand, herd size/composition determines the sustainability of dairy farming in the targeted sites. The project priority is working with smallholder dairy farmers. The project recognizes smallholder dairy farmers as those who keep 1 to 5 heads of cattle. It was therefore important for the project to identify potential sites with higher proportions of smallholder dairy farmers who are the project main target group. Moreover information on herd size in different project sites would be important in guiding project interventions, for instance the formulation of nutrition, animal health and breeding plans. Table 3 and 4 summarizes the findings from both site selection (feasibility) and baseline survey.

Table 3: Cattle breeds

Hub Name	Feasibility June 2014 (dominant cattle breed)	Baseline November 2014 (% of HH)		
		Local	Cross	Pure
Mviwambo (n_b=59)	Friesian cross	86.4	20.3	13.4
Ilembo (n_b=58)	Friesian cross	82.8	20.7	10.3
Kyimo (n_b =57)	Friesian & Ayrshire crosses	17.5	64.9	30.0
Isange (n_b =60)	Friesian & Ayrshire crosses	41.7	50.0	21.7
Mbeya Cluster (n_b =234)		**57.3**	**38.9**	**18.8**
Igima (n_b =62)	Friesian & Ayrshire crosses	64.5	7.0	22.6
Kichiwa (n_b =57)	Friesian & Ayrshire crosses	89.4	19.4	10.5
Uwemba (n_b =56)	Friesian & Ayrshire crosses	44.6	33.9	38.0
Njombe cluster (n_b =175)		**66.3**	**20.0**	**23.4**
Igowole (n_b =56)	Local zebu	73.2	17.9	17.9
Ifunda (n_b =56)	Local zebu	76.8	16.0	17.9
Mtitu (n_b =58)	Friesian cross	75.9	36.2	8.6
Iringa cluster (n_b =170)		**75.2**	**23.5**	**14.0**

Data source; Baseline survey November 2014 and feasibility study July 2014
Note: n_b *= Number of observation for baseline survey*

During the site selection (feasibility) the team collected information about the dominant cattle breeds kept in each of the assessed sites and the average number of cattle per household. Similarly, the baseline survey collected data on the types and numbers of cattle the farmers kept.

From the feasibility study, the overall results reveal that in 8 sites out of 10 most farmers kept improved/cross breeds of dairy cattle. Njombe and Mbeya cluster were recorded to have 100% of farmers keeping cross breeds while in Iringa cluster 33% were recorded as keeping cross breeds. However, as evident in Table 3, in all the three clusters local breeds were found to be the dominant breed (57.3%, 66.3% and 75.2% in Mbeya, Njombe and Iringa, respectively) based on the from estimates derived from the baseline data.

Further, as evident in table 3, there were six cases where the feasibility and baseline data differs i.e. Mviwambo, Ilembo, Igima, Kichiwa, Uwemba and Mtitu hubs which reported cross breeds as dominant in the feasibility study yet the baseline revealed high proportions of households with local breeds. It is worth noting that from both the baseline and feasibility studies, the assessment of breed types was based on the perception of the respondents (no attempts were made to characterize the breeds using scientific method like genotypic analysis). In particular, farmers' knowledge on breed types could have been largely determined by the phenotypic appearance of the cattle they keep. It can also be assumed that the possible error in categorizing cattle as cross bread instead of local breeds would be the same during the feasibility and the baseline survey; the difference between the two results cannot therefore be explained by this possible mis categorization. That notwithstanding, baseline survey followed the feasibility study and was more rigorous in terms of the intensity of data collection, meaning that the results from the feasibility study are less robust than the baseline data.

From the evidence presented in Table 3, we conclude that the site selection would not have arrived at similar conclusions as the baseline in terms of the dominant cattle types kept by dairy farmers in the assessed sites.

The variation between the two data sets may be attributed to variation in area of coverage of the assessments. Feasibility study concentrated on respondents within a ward (<=10 Km radius) while baseline covered a wider in a wider range of about 15-20 km radius from the centre of the proposed hub location in the site.

In addition to the dominant cattle types that farmers kept, data on the number of cattle kept was also collected. However in the case of site selection assessment, the data was only collected during feasibility study. Table 4 presents the findings for both feasibility and baseline results.

Table 42: Herd size per Household

Hub	Feasibility	Baseline		
	Average No of mature dairy cattle/HH	Mean	S.D	Sample size
Mviwambo	2 to 4	3	2.0	59
Ilembo	2	3	2.0	58
Kyimo	2 to 4	2	0.9	57
Isange	1 to 3	2	2.0	60
Mbeya Cluster	**1 to 4**	**2**	**1.9**	**233**
Igima	1 to 3	4	4.0	62
Kichiwa	1 to 3	4	4.0	57
Uwemba	1 to 3	4	4.0	56
Njombe Cluster	**1 to 3**	**4**	**4**	**175**
Igowole	2 to 4	4	3.0	56
Ifunda	2 to 6	7	6.0	56
Mtitu	2 to 4	6	6.0	58
Iringa Cluster	**2 to 6**	**6**	**5.4**	**169**

Data source; Baseline survey November 2014 and feasibility study July 2014

From the feasibility study, the average number of dairy cattle per farmer was captured in ranges. On the other hand the baseline survey data captured the exact number of dairy cattle kept by each farmer. Results reveal that Njombe and Mbeya clusters farmers are predominantly smallholder farmers with an average of less than 5 heads of cattle, while herd sizes are larger in Iringa cluster. Variation in the number of dairy cattle kept per farmer is higher in Iringa cluster compared to Mbeya and Njombe. The results in Table 4 shows that in Mtitu hub in Iringa cluster, contrary to the feasibility study results which indicate that the farmers are smallholders, baseline survey results showed on average farmers keep 6 heads of cattle per household. However the significance of the difference cannot be estimated given that no means can be computed from feasibility study. Thus, site selection results are comparable to the results from the baseline survey in only 4 out of 10 sites where the mean number of dairy cattle per farmer in these sites is within the same range as feasibility study values.

The estimates of the average milk production per cow per day from both the site selection assessment (feasibility study) and the baseline survey are presented in Table 5. From baseline the average lactation yield per cow per day was estimated as the arithmetic mean from all lactating cows at the time of the survey (irrespective of the breed) as reported by farmers during the baseline survey. On the other hand, the means for feasibility study were estimates reported by farmers and other key informants during focus group discussion and key informant interviews respectively. During the discussion the key informants and farmers were asked to give estimates of the average production per cow per day for dairy cows only, leaving out the local breeds.

Table 5: Average daily milk production per cow

Hub	Feasibility	Baseline	Deviation (feasibility & Baseline)	S.D (Baseline)	Sample size baseline[1]
Mviwambo	9.7	8	1.7	3.4	3
Ilembo	12.0	2	10.0	0.0	1
Kyimo	15.0	8	7.0	3.8	13
Isange	12.0	4	8.0	2.1	11
MBEYA CLUSTER	**12.0**	**6**	**6.0**	**3.5**	**28**
Igima	8.0	10	-2.0	5.9	6
Kichiwa	11.5	8	3.5	3.5	3
Uwemba	8.0	8	0.0	0.9	6
NJOMBE CLUSTER	**9.0**	**9**	**0.0**	**4.0**	**15**
Igowole	10.0	9	1.0	2.4	4
Ifunda	7.0	5	2.0	4.0	5
Mtitu	8.0	5	3.0	3.7	10
IRINGA CLUSTER	**8.0**	**6**	**2.0**	**3.8**	**19**

Data source; Baseline survey November 2014 and feasibility study July 2014

From feasibility results, Kyimo had the highest average milk production per cow per day (15 litres) while Ifunda had the lowest (7 litres). On the other hand, the results from baseline survey revealed that Igima had the highest average milk production per cow per day (10

[1] Sample size on reported milk production is very small considering the total number of households interviewed per site. The main reason is that during baseline a household was sampled only if it keeps cattle without considering whether there was a milking cow during the time of survey.

litres) while Ilembo had the lowest averages (2 litres). Overall, from feasibility study, comparing the two data sets, Mbeya cluster had the highest average milk production per cow per day (12 litres) while Iringa cluster had the lowest averages (8 litres).

On the contrary, from baseline survey results, Njombe cluster had the highest averages for milk production per cow per day (9 litres) while Mbeya and Iringa had similar values (6 litres). Milk production is a function of many variables, including cattle type/breed, lactation length, feeds and feeding practices etc. From the baseline results the averages of production were derived from the best cross breeds and their daily lactation yield was used in estimation. There was a significant difference between the feasibility and baseline survey average milk production in 3 (Ilembo, Kyimo, and Isange, all in Mbeya cluster) sites i.e. mean deviation is above the mean SD for the 3 sites. The averages for feasibility were taken only from improved dairy cows, while baseline survey randomly selected cattle keepers irrespective of the breed from which the aggregate milk production was calculated. However, for comparison purpose between the two data sets, from the baseline data, only the yield per cow per day for best producers crossbreeds were considered, since the reported dominant breed in feasibility was cross breeds. Caution needs to be exercised when interpreting these results given the relatively low sample size obtained at baseline.

Conclusively, the site selection assessment adequately informed site selection in 7 of the 10 sites regarding milk production. Given the small sample size on this indicator at baseline, it is difficult to conclude whether the two surveys would have arrived at similar conclusions.

3. **Did site selection assessment sufficiently inform on feeding systems and availability of fodder?**

The feeding system depicts the predominant farming system in the area i.e. whether intensive or extensive, and as such, the types of farmers in the area i.e. smallholder semi-/intensive or large extensive farmers. This information was important in site selection for potential EADD II sites in order to identify target farmers and consequently the farming system they use. Moreover, feeding systems determines the types of interventions/technologies to promote.

The feasibility study asked key informants and farmers about the predominant feeding system in each site. Likewise, baseline survey respondents were to indicate the feeding system they used by breed of cattle they kept and also the dominant system during rainy and dry season. Table 6 below gives the results from the two data sets. The table 6 presents results on the major feeding system used by farmers from both the baseline and site selection assessment.

Table 3: Grazing systems

Hub	Feasibility (Major system of grazing cattle	Baseline (% of Households)			
		Only grazing	Mainly grazing with stall feeding	Mainly stall feeding with grazing	Only stall feeding
MVIWAMBO (nb=59)	Zero grazing	88	0	0	12
Ilembo (nb=58)	Zero grazing	84	2	0	14
Kyimo (nb=57)	Zero grazing	23	5	4	68
Isange (nb=58)	Zero grazing	57	7	5	31
Igima (nb=57)	Zero grazing	70	0	0	30
Kichiwa (nb=57)	Zero grazing	89	0	0	11
Uwemba (nb=52)	Zero grazing	56	0	0	44
Igowole (nb=53)	Zero grazing	77	4	2	17
Ifunda (nb=55)	Free range	80	1	0	18
Mtitu (nb=57)	Zero grazing	89	0	2	9

Data source; Baseline survey November 2014 and feasibility study July 2014
Note: n_b *= Number of observation for baseline survey*

While the baseline survey captured data on the feeding system used for the different cattle types (local, cross and pure) and in different season (dry and wet), the site selection assessment collected generalized information without specific regards to the cattle types and

the different seasons. For easy of comparisons the seasonal effects were left out in the analysis.

The results in table 6 revealed that the major system of grazing cattle in 9 sites as reported during feasibility study was zero grazing which is an equivalent of only stall feeding as per baseline. This means that based on site selection results a conclusion was made that majority of the farmers in the catchment area of the different sites practiced zero grazing for their dairy animals. Looking at the baseline survey results, it can be observed that the prominent mode of grazing dairy cattle within the 9 sites is only grazing as reported by majority of interviewed households. However, only stall feeding would rank the second after only grazing and is the common system used for households keeping either cross or exotic breeds. There are only two sites (Kyimo and Ifunda) for which the feasibility and baseline results coincide.

The overall conclusion is that the results do not match between feasibility and baseline, due to the bias towards exotic cattle during site selection.

Fodder availability is one of the components that can help the project to improve milk production both in the short and in the long run. Assessing the availability of these feeds in the different sites was therefore key in identifying which sites already had the greater potential in terms of existence of the necessary structures for improving milk production. These would guide in prioritizing the sites for project interventions. During site selection participants were asked about the availability of improved types of feed and fodder like Napier grass, Desmodium, Calliandra, Lucaena and many others. Similarly during baseline survey, respondents were also asked about the various types of improved fodder they grow. From the results presented in Table 6, site selection assessment found that there was no improved fodder or pastures in 3 sites (Mviwambo, Igima and Ifunda).

However the baseline survey results revealed that fodder cultivation was practiced in all sites, with 4 sites (Mviwambo, Kichiwa, Ifunda and Mtitu) having low adoption (less than 10% of farmers). Igima farmers however reported that about a quarter of farmers grow improved fodder or pasture. The commonly grown type of fodder is Napier. Farmers in all hubs cited

lack of technical information and insufficient land (Mbeya and Iringa) as the main reasons for low adoption of improved fodder and pastures. In addition, in Njombe cluster, lack of knowledge on the importance of establishment of fodder ranked second in terms of the predominant reason for farmers not planting improved pastures.

Table 7: Fodder/forage cultivation and availability

Hubs	Feasibility (availability of fodder)	Baseline % households growing forages
Mviwambo (n_b =59)	No	5.0
Ilembo (n_b =58)	Yes	29.0
Kyimo (n_b =57)	Yes	74.0
Isange (n_b =60)	Yes	36.7
Igima (n_b =62)	No	22.6
Kichiwa (n_b =57)	Yes	8.8
Uwemba (n_b =56)	Yes	32.7
Igowole (n_b =56)	Yes	26.8
Ifunda (n_b =56)	No	8.9
Mtitu (n_b =58)	Yes	5.2

Data source; Baseline survey November 2014 and feasibility study July 2014

Note: n_b *= Number of observation for baseline survey*

In Kyimo, the percentage of farmers who reported to be growing improved fodder is relatively large (74%) as compared to the other sites. Overall, the results show that baseline survey results are comparable to site selection assessment in 7 out of 10 in terms of the availability of improved pastures (i.e where more (less) than 10% of farmers grew fodder, it was considered that fodder is available (not available)).

4. Did site selection assessment sufficiently inform on women participation in dairy activities

EADD II project was designed as a gender transformative project. One of its main objectives is to empower women through leadership and financial services that help improve their access to and control over productive assets. The project intends to empower women both at the PO and household levels in terms of decision making and leadership positions. As a major project objective site selection assessment had to be informed by the level of women participation in leadership and decision making in the sites.

Both feasibility and baseline survey collected data on involvement of men and women in dairy activities. In this study however, women involvement assessment has been restricted to household level and in particular production and decision making over proceeds from milk i.e. women engagement in production and marketing.

Women participation in dairy activities was evaluated in terms of the average number of hours spent per female (above 15 years) in undertaking 4 dairy activities (herding, watering, milking and spraying/dipping) per week using baseline data. In addition to the four activities, we also assessed from the baseline data the gender of the main decision marker in the dairy farm household, on how proceeds from morning milk are spent.

Baseline survey data consisted of total numbers of hours household members (aged 16 years old and above) and hired labourers (male and female) spent on the activities in the 7 days preceding the day of the survey as a proxy estimate for weekly labor. For ease of comparison, the percentages of the households that reported women to be engaging in activities versus men was estimated.

Table 4: Percentage of hours spent by men and women in various dairy activities

Variable	Feasibility (women participation)	Baseline (% of hours in a week)	
		Men	Women
Herding	YES	58	42
Feeding	YES	54	46
Watering	YES	58	42
Milking	YES	60	40

Data source; Baseline survey November 2014 and feasibility study July 2014

The baseline data was much more detailed as hours spent on various dairy activities by men, women and youths (male and female) were captured. On average in a week for all clusters, men spent more hours in herding, feeding, milking and watering. Watering was defined as the act of giving water to cattle, either trekking them to dams or fetching from tape/river. In some areas water was readily accessible in the farm while other areas water is fetched from a distant, this determines the gender involved in the activity and the average hours spent for the same. On the other hand men spend more hours in a week for milking as compared to

women. Comparing feasibility study and baseline survey results, it can be concluded that the results are similar meaning that women are actively involved in dairy activities; however they spend fewer hours on various activities than male (Table 8).

After milk production, milk is sold to different outlets by the households; the aim of the project is to see more women engaged in decision making both at the PO and household levels. The decision making should not however be solely left to women but men should be engaged as well. Consequently, increasing joint decision making both at PO and the household level is the desired outcome of the project.

In this study, only proceeds from morning milk have been considered since limited information was captured for the evening milk during the baseline survey. Results for the decision on the proceeds from morning milk are presented in table 9.

Table 5: Decision on the proceeds from morning milk

Hub	Feasibility (women participation)	Baseline (% of Households)						
		Head (main Male)	Spouse (main female)	Joint Head & Spouse	Other Female	Other male	Other Joint	Others
MVIWAMBO (n=4)	YES	75.00	0.00	25.00	0.00	0.00	0.00	25.00
ILEMBO (n=4)	YES	75.00	25.00	0.00	0.00	0.00	0.00	0.00
KYIMO (n=14)	YES	29.00	14.00	57.00	0.00	0.00	0.00	0.00
ISANGE (n=4)	YES	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Mbeya Cluster (n=26)		**53.85**	**11.54**	**34.62**	0.00	0.00	0.00	3.85
IGIMA (n=7)	YES	0.00	43.00	57.00	0.00	0.00	0.00	0.00
KICHIWA (n=6)	YES	17.00	33.00	57.00	0.00	0.00	0.00	0.00
UWEMBA (n=20)	YES	20.00	35.00	40.00	0.00	0.00	5.00	0.00
Njombe Cluster (n=33)		**12.12**	**36.36**	**45.45**	3.03	0.00	3.03	0.00
IGOWOLE (n=12)	YES	17.00	33.00	50.00	0.00	0.00	0.00	17.00
IFUNDA (n=11)	YES	18.00	36.00	36.00	9.00	0.00	0.00	0.00
MTITU (n=9)	YES	44.00	11.00	44.00	0.00	0.00	0.00	0.00
Iringa Cluster (n=32)		**25.00**	**28.13**	**43.75**	**3.13**	0.00	0.00	6.25

Data source; Baseline survey November 2014 and feasibility study July 2014

Note: n_b *= Number of observation for baseline survey*

From the results presented in table 9, it can be observed that there is high degree of women participation on the proceeds from morning milk for the 8 hubs out of 10. Only two hubs,

(Mviwambo and Isange) in which women completely have no decision on the proceeds from morning milk. Isange hub is more men dominant (100%) on the decision from the proceeds of morning milk. However; joint decision making was prevalent in almost all hubs (8 out of 10). The results are similar with the site selection results on the involvement of women in dairy activities in which in all 10 hubs women were actively taking role in decision making on milk sale.

From the discussion under the independent aspects of assessing women involvement in dairy activities and milk marketing, it can be observed that site selection and baseline results would have ranked 8 out of 10 sites in the same way.

5. Overall results

Table 6: Overall summary

Indicator	No of sites at site selection assessment	No of sites where baseline and site selection coincide	Proportion of the coinciding sites
Daily milk production per cow	10	7	70%
Primary economic activity	10	10	100%
Cattle types	10	6	60%
Herd size	10	4	40%
Grazing systems	10	8	80%
Fodder cultivation	10	8	80%
Gender	10	10	100%
Total	**70**	**53**	**76%**

Table 10 above presents the overall comparison of the site selection assessment results compared with the baseline with respect to the 7 indicators that were considered for the study. The results reveal that site selection assessment and baseline results strongly coincide for 4 indicators (primary economic activity, grazing systems, fodder cultivation and gender).

The results also fairly tally for cattle types and average daily milk production per cow while less than half the sites had similar results for herd sizes.

Conclusion

The study revealed that the baseline survey results would rank 76% of the sites –indicators combinations the same way as the site selection assessment. This is equivalent to 7 out of 10 sites identified during the site selection assessment. The indicators for which the data do not tally are herd size, cattle breed types and milk yield.

For these 3 variables, the fact that results differ for more than 3 sites can be explained by the differences in the mode of sampling, type of respondents, data collection instruments and the structure in which questions were designed in the two data collection tools. The difference between the results of the 2 surveys concerns key EADD indicators of milk yield and herd size; having biased values at site selection may have influenced site selection towards sites that may not fully match EADD criteria.

Reference

Hayes David 2011, 'Look forward in East Africa' ProQuest, Oct 2011

Nkya, R., Kessy, B.M., Lyimo, Z.C., Msangi, B.S.J., Turuka, F. and Mtenga, K., 2007. Constraints on smallholder market oriented dairy systems in the north eastern coastal region of Tanzania, Tropical Animal Health and Production, 39, 627 – 636.

Appendices

Appendix 1: Distribution of primary activities per Hub (Baseline data)

Type of activity	**Hub**											
Primary activity	Vwawa	Kyimo	Ilembo	Isange	Uwemba	Kichiwa	Ifunda	Igowole	Mtitu	Igima	Total	% HH
None	0	0	0	0	0	1	0	0	2	0	3	0.5
Farm management/ farm	56	51	56	55	47	55	50	44	51	52	517	89.3
Household work wife	0	0	0	0	0	0	0	1	1	0	1	0.2
Labourer on farm	0	0	0	0	0	0	0	0	0	0	1	0.2
Labourer off farm	0	0	0	0	0	0	1	0	0	0	1	0.2
Civil servant	0	2	0	2	2	0	1	3	0	5	15	2.6
Employee in private e	0	0	0	0	0	0	2	3	1	1	6	1.0
Businessman own business	0	2	1	0	2	0	2	1	0	2	11	1.9
Retired with pension	1	0	0	0	1	0	0	1	0	0	3	0.5
Retired without pension	0	0	1	2	3	0	0	0	3	0	6	1.0
Religious leader	0	0	0	1	1	1	0	1	0	0	7	1.2
Other	2	2	0	0	0	0	0	2	0	1	7	1.2
Other specify	0	0	0	0	0	0	0	0	0	1	1	0.2
Total	59	57	58	60	56	57	56	56	58	62	579	100.0

Detailed description of the study variables

- Daily Milk production per cow

Defined as the amount of milk produced per cow per day otherwise referred to as cow productivity; the overall objective of the East Africa Dairy Development Project 2 (EADD2) is to increase incomes of small holder dairy farmers within the sites where interventions are directed by increasing milk production per cow and consequently milk production per household. It was therefore prudent to have this variable included for the study to check whether what was collected during site selection actually tallies with the results from the baseline. Primary economic activity

EADD2 is a dairy project and therefore aims to work within communities where dairy farming is a key source of livelihood/income to the dwellers. By exploring the primary economic activities within the selected sites and comparing with the responses from site selection, it would give a glimpse of whether the project is working with the right communities.

- Cattle types

One of the project's targeted key outcomes is improving milk production in dairy farm households. Milk production per cow is a function of many aspects part of which is the cattle breeds and types. Among other productivity enhancing technologies, the project aims at improving milk production through breeding in order to produce superior cattle genotypes with higher productive potential. It was therefore important to identify which cattle types are kept in which sites to inform project interventions and priorities in terms of cattle breed improvement.

- Herd size

The project intends to work with smallholder dairy farmers. Ideally, the project recognizes smallholder dairy farmer as those who keep 1to 5 heads of cattle. It was therefore important for the project to identify potential sites with higher proportions of smallholder dairy farmers, who are the projects main target group. Moreover, information on herd sizes in different

project sites would be important in guiding project interventions, for instance, the formulation of nutrition, animal health and breeding plans.

- Grazing systems

Grazing systems implicitly depict the predominant farming system in an area i.e. whether extensive or intensive, and as such the types of farmers in the area i.e. smallholder intensive or large extensive farmers. This information was important in site selection for potential EADD sites in order to identify the target farmers and consequently the farming system they use. Moreover, grazing systems determine the type of interventions/technologies to promote. What may suitably apply in the extensive system might not apply in the intensive system. It was therefore important to identify the dominant grazing system in the sites to guide project interventions.

- Fodder cultivation

Fodder availability is one of the components that can help the project improve milk production both in the short and in the long run unlike breed improvement which is a long-term in. Assessing the availability of these feeds in the different sites was therefore key in identifying which sites already had the greater potential in-terms of the existence of the necessary structures for improving milk production. These would guide in prioritizing the sites for project interventions.

- Gender

EADD project was designed as a gender-transformative project. One of its main objectives is to empower women through leadership and financial services that help improve their access to and control over productive assets. The project intends to empower women both at the PO and household level in terms of increasing their ability to actively participate in PO activities as well as being involved in decision making. As a major project objective, site selection assessment had to be informed by the level of women participation in leadership and decision making in varous sites. In this study however women involvement assessment has been restricted to household level and in production and decision making over proceeds from milk.