Socio-Economic and Technology Transfer Factors Influencing Adoption of Dairy Goats among Smallholder Farmers in Some Districts in Kenya

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Abstract

The purpose of the study was to provide an understanding of how socio-economic and technology transfer factors influenced the adoption of dairy goat technologies among smallholder farmers in selected districts in Kenya. An *ex-post facto* survey was used whereby 150 farmers and 8 extension workers were interviewed. A multiple regression analysis was applied using Statistical Package for Social Sciences at 0.05 level of significance. The results indicated that a combination of socio-economic and technology transfer factors influenced adoption of dairy goats by 37%. However socio-economic factors singly contributed 30% and technology transfer factors contributed 5%. Income, gender, time spent on dairy goat activities and use of mass media, were found to be positive and statistically significant factors influencing adoption of dairy goats. These findings provided predictive factors that influenced adoption and may be important to policy makers, project designers', researchers and extension agents in the improvements of the dairy goat project designs, implementation and dissemination strategies. It may contribute to a tailor-made extension method encourage innovativeness among stakeholders in a bid improve adoption of dairy goats among smallholder farmers in Kenya. This will contribute towards increased food security and income generation in the region.

Key Words: Adoption; Dairy goats; Innovation; Smallholder farmers; Socio-economic factors; Technology transfer factors.

1. Introduction

One of the most important means of accelerating National development in agricultural-based economies is the development, adaptation and evaluation of new agricultural innovations (Kuper and Kuper, 1996). Kenya's economy and social development challenges are unemployment, poverty, food security and slow economic growth among others (MOA, 2004). FAO (1999) stipulated that poverty afflicts 56% of the Kenyan population and that Kenya is among other countries in Africa whose percentage of undernourished persons is greater than 35%.

In Kenya some of the major factors contributing to food insecurity include inadequate research and dissemination of technological innovations, weak farmers' institutions as well as poor linkages and coordination within the institutions (GoK, 2001a). According to Ruthuku (2007), agriculture contributes 53% of Gross Domestic Product (GDP) directly and indirectly through crop development, linkages with manufacturing, distribution and other service related sectors. It also provides 59% of total export earnings and employment to over 70% of the country's population.

1.1 Background information

In line with embracing the Millennium Development Goals (MDG), which includes eradicating extreme poverty and hunger (GoK, 2008), there is need for effective adoption of technologies. Dairy goats can result in higher incomes, lower real prices of agricultural products for consumers, and enhanced greater economic efficiency and growth in the national economy (Swanson, 1984). Dairy goat milk production currently ranges at 1-3 litres per day while the potential ranges at 3-4 litres per day. Achieving full potential of dairy goats requires an understanding of how and why farmers make long-term land-use decisions and applying this knowledge to the design, development and marketing of dairy goat technologies (Mercer, 2004). Poverty alleviation and food insecurity are among the major socio-economic problems, which must be addressed due to their negative impact on people's quality of life (Kiome, 2003).

1.1.1 The global livestock situation

According to the Food and Agriculture Organization (Ehim *et al*., 2003). the world goat population has grown by about 13%, and despite their low milk production, goats contribute significantly to the economy and food supply and the demand for their products exceeds their availability .

1.1.2 The African Situation

The African continent has 26% of the small ruminant population **(**Lebbie, 2004**).** In the Southern African region, the Southern African Development Coordination Conference (SADCC) suggested research to strengthen the national and regional capacity to develop the transfer technology needed to assist smallholders. Trends in East Africa that have

increased interest in goat production include insecurity, land fragmentation, retrenchment of staff, privatization, marginalization and impoverishment (Kyomo, 2006).

1.1.3 The Kenyan Situation

The livestock industry contributes an estimate of 10% of the GDP and accounts for over 30% of farm-gate value of agricultural sector commodities and employs about 50% of the total agricultural labour force directly and indirectly (Ruthuku, 2007). Nationally, goats and sheep contribute about 30% of the total red meat , milk, wool, skins and manure (Smith *et al*., 2004). The population of dairy goats in Kenya by 2001 was estimated to be 90,826 of a total sheep and goat population of 19 million (Smith *et al*., 2004). These figures translate to a 0.48% of dairy goats among shoats indicating a very low uptake of dairy goats in Kenya. Improving the performance of goats and other small ruminants can directly improve the diet of many people, because these animals are inherently suited to the needs of smallholders and pastoralists in the developing countries (Semenye, 1992).

1.2. The Situation of the study area

In Nakuru North district dairy goat production has been supported by Ministry of Livestock Development (MoLD), Dairy Goat Association of Kenya (DGAK) and Farming Systems-Kenya (FSK). MoLD has been involved in the formation and training of dairy goat groups through the National Agriculture and Livestock Programme (NALEP). DGAK has been concerned with the registration and provision of breeding stock, while FSK has been involved with trainings and provision of breeding stock. Kenya Agricultural Research Institute –Agricultural Technology and Research Institute (KARI-ATIRI) projects in collaboration with MoLD have also supported groups in the district with breeding bucks through FSK.

The promotion of dairy goats in Muranga North was initiated by Integrated Small Livestock Projects (ISLP) and implemented by MoLD with assistance from German Technical Corporation (GTZ) between 1992 – 1997 (Wandera *et al*., 2000). Upgrading scheme of the local goats was vigorously promoted using German Alpine bucks through groups to produce the Kenya Alpine dairy goat with a minimum blood level of 87.5%. To date, dairy goat promotion in the region is promoted by DGAK, Promotion of Agricultural Extension Services (PAES) and MoLD.

Dairy goat production in Meru Central was supported by FARM-Africa, a British Non Governmental Organization in 1996 (Maigua, 2004). The project introduced the British Toggenburg dairy goats through groups. Farm-Africa in conjunction with MoLD assisted small scale dairy farmers to crossbred Toggenburg in order to ensure sustainability through continuous availability of suitable breeding stock particularly bucks (Smith *et al.*, 2004). Farmers in these areas have formed the Meru Goat Breeders Association (MGBA).

Kenya Agricultural Research Institute (KARI) has recognized the important role that dairy goats play and prioritised it as number three (3) in about fifty nine (59) commodities and factor research programmes (Wandera *et al.*, 2000). However, despite the over twenty years, that have been spent on dairy goat research, adoption remains low for farmers to feel the impact of this research effort (Wandera *et al.*, 2000). According to the Department for International Development (DFID), (2004), FARM -Africa and KARI carried out a research in central Kenya on community based goat productivity improvement .The results indicated that the breeding programmes failed because projects were evolved and implemented without the beneficiaries input. Low dairy goat technology uptake was suggested as an information gap in a research workshop in Machakos Kenya (Wandera, Okwach and Njarui, 2000).

1.3. Problem statement

In spite of the several years of research on an appropriate dairy goat breed, with potential for economic improvements and enhanced food security among smallholder farmers, adoption in the three districts being studied has remained low. Several factors may influence the adoption of dairy goats by the farmer. In particular, the influence of socio-economic and technology transfer factors have not been fully understood by stakeholders in this enterprise. An improved understanding of these factors in relation to programme design and implementation will influence the adoption of dairy goats among smallholder farmers in selected districts of Kenya.

1.4. Purpose of the study

The purpose of this study was to determine how socio-economic and technology transfer factors influenced the adoption of dairy goat technologies among smallholder farmers in 3 districts of Kenya.

1.5 Objectives of the study

The objectives of the study were to describe the characteristics of dairy goat farmers in the three districts, to characterize dairy goat technologies promoted to farmers in the three districts, to assess the influence of farmers' socio-economic and technology transfer factors on adoption of dairy goat technologies among smallholder farmers in the three districts.

1.6 Hypothesis

HO_1 There is no significant statistical influence of farmers' socio-economic factors on adoption of dairy goat technologies among smallholder farmers in the three districts.

HO_2 There is no significant statistical influence of technology transfer factors on adoption of dairy goat technologies among smallholder farmers in the three districts.

HO_3 There is no significant statistical influence of farmers' socio-economic and technology transfer factors on adoption of dairy goat technologies among smallholder farmers in the three districts of Kenya.

1.7 Significance of the Study

The study was designed to determine the influence of socio-economic and technology transfer factors on adoption of dairy goats among smallholder farmers in Nakuru North, Murang'a North, and Meru Central districts of Kenya. The findings are hoped to contribute towards enhancing strategies to improve design, implementation and dissemination of dairy goat projects. They will also be useful to policy makers to create an enabling environment to dairy goat farmers, extension workers in designing suitable extension methods to reach the dairy goat farmers and researchers while researching for suitable dairy goat technologies in their endeavour to address the challenges of improved adoption of dairy goats. Ultimately, this will contribute to increased food security and improved standards of living of the smallholder farmers.

1.8 Scope of the Study

The study was designed to investigate the influence of socio-economic and technology transfer factors on adoption of dairy goats among smallholder farmers in Nakuru North, Murang'a North, and Meru Central districts of Kenya. Socio-economic factors were limited to age of Household Head (HH), gender of HH, education level of HH, average farm income and time availability on the farm. Technology transfer factors were limited to Technology Transfer (TT) channels used, extension agents' qualifications and experiences, sources and availability of information. In case of an absentee HH the decision maker present was considered as a suitable respondent.

1.9 Assumptions

The study assumed that the dairy goat breeds available were the most appropriate for the smallholder farmers, that the respondents gave correct information meaningful for analysis and hypotheses testing and that the moderator variables affected all farmers equally because of similarities in experience with institutional factors, macro and microclimate and similar socio-cultural and personal characteristics.

1.10 Limitations

The generalizations of this study were limited to areas of similar characteristics with those of the study areas.

1.11 Definitions of Key Terms

Adoption: Was defined as the decision, to make full use of a new idea as the best course of action available (Rogers, 1995) operationalised in this study as, the decision to adopt the dairy goat and all the eight extension packages in the study.

Diffusion: Is the process by which an innovation is communicated through certain channels over time among the members of a social system (Rogers, 1995). In this study diffusion will be defined as communicating the dairy goat and the extension packages through mass media methods, group methods and individual methods to the farmers.

Innovation: Is a practice, idea or an object that is perceived as being new by individuals (Van den Ban, 1996). In this study innovation represented the improved dairy goat and the packages which are perceived as being new to the farmers.

Smallholder: According to G.O.K (2005) Kenya smallholders are defined as farmers owning 0.2 – 12 hectares and this definition was maintained in this study.

*Socio-economic factors***:** These are variables that relate to innovativeness of a farmer and include personal and socio-cultural characteristics (Rogers, 1995), for the purposes of this study they will include age, gender, level of education of household head, labour availability and average annual income of the farm.

*Technology transfer (TT***):** This is helping to convey information in such a way that it fulfils a particular need of the client; it can be effectively applied by the client to his or her own situation (Blackburn, 1989). This definition was maintained in this study and the TT factors were TT agents, TT channels, TT approaches and information sources.

Technology: Is the transformation of scientific laws into machines, tools, mechanical devices, instruments, innovations, procedures and techniques to accomplish tangible ends (Rogers, 1995). In this study, technology referred to the adoption of the dairy goat and the dairy goat technologies which range from kid rearing, housing, nutrition, records keeping, health, breeding, husbandry and milking.

2. Literature Review

A similar study was done in the Delta State of Nigeria by (Ofuoku, *et al*). The results indicated that low level of adoption was attributed to cost of the technologies, their complexities and lack of extension contact. The level of education, age of farmers, farm size, farm income and extension contact were the major determinants of fish production technologies adoption at 0.05 level of significance. According to Wambugu *et al.* (2011) a study done on adoption of fodder shrub innovations in East Africa indicated that the constraints and challenges include ineffective delivery of extension and research services, inhibitive policies, political interferences, frequent droughts and inadequate monitoring and evaluation systems.

2.1 Theoretical Framework

In adoption/diffusion theories, Rogers (1995) postulated that the "top-down" and "bottom-up" models of adoption/diffusion provide a directional perspective to the process. According to Eneh, (2010) adoption and diffusion process generally follow what has been termed the "traditional model," a "top-down" process in which administrative "mandate" introduce the technology and administrative perceptions, decisions and strategies drive adoption and diffusion.

Adoption is also dependant on, the nature of communication channels diffusing the innovation at various stages in the innovation decision process, the nature of the social system, and the extent of change agents' efforts in diffusing the innovation. The innovation - decision process can lead to either adoption or rejection of an innovation and such decisions can be reversed at a later stage e.g. discontinuance (Rogers, 1995).

A number of factors play various roles in determining adoption. Rogers and Shoemaker (1971) provided a framework indicating that the technological superiority of an innovation plays a relatively minor role in determining adoption. Many other factors, most of them relating to the social factors present at the adopting site, play just as large a role as technological superiority in influencing rate of adoption. The theoretical framework was adopted and modified for the purposes of this study as shown in Figure 1.

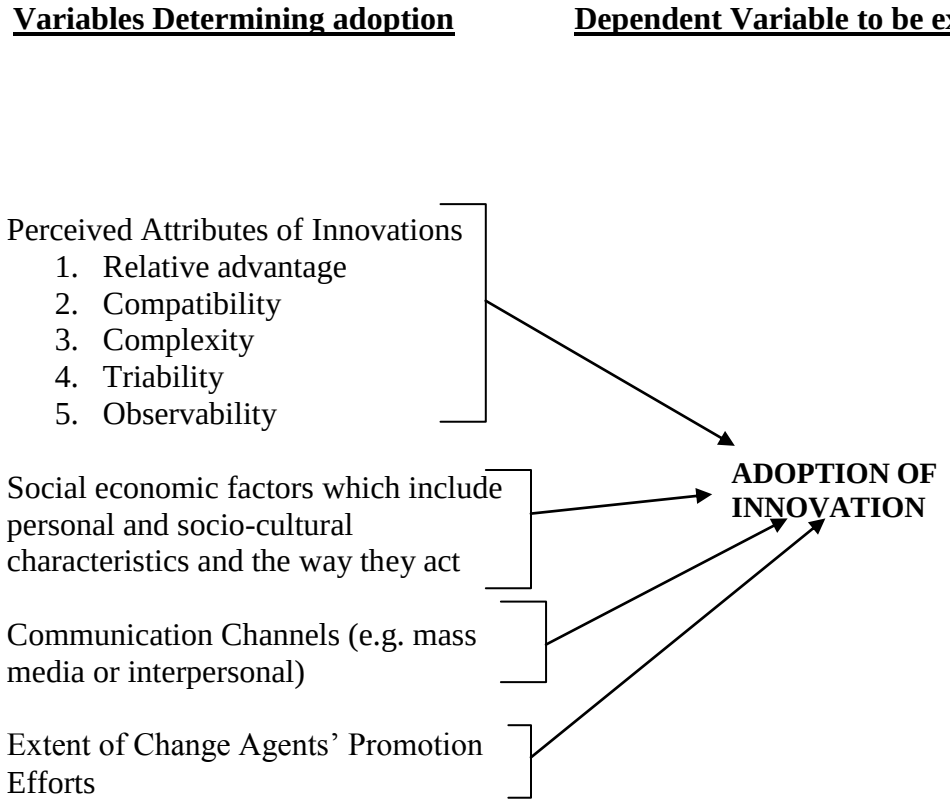

Figure 1: Theoretical Framework. Adopted from (Rogers and Shoemaker, 1971) and Modified for the Purpose of the Study.

2.2 Conceptual Framework

The theoretical framework was modified to produce the conceptual framework in figure 2 which provides a contextual setting indicating socio-economic and technology transfer factors as independent variables and adoption factors as the dependent variables. It also outlines the interactions with the moderator variables.

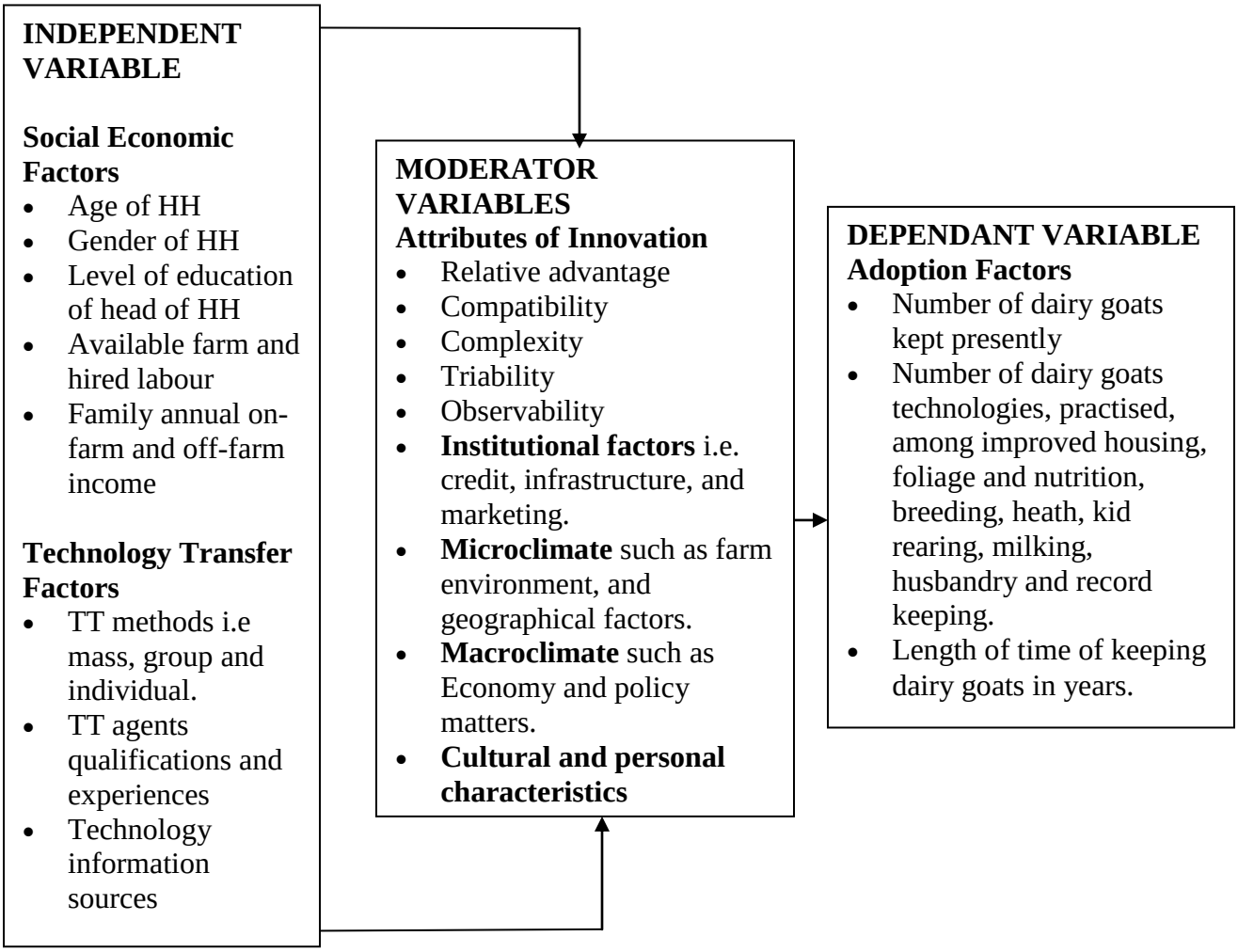

Figure 2: Conceptual Framework Model, Identifying Factors Influencing the Adoption of Dairy Goats.

3. Methodology

3.1 Research Design

A survey method of *ex-post facto* approach was utilized. The design assisted to describe the conditions and quantify factors associated with the independent variables of the study (Kaewswonthi and Harding, 1992). The method provided for data collection necessary to determine the current status of the population at that particular point in time (Cohen and Manion, 1989), in respect to socio-economic and technology transfer factors and their influences on the adoption of the dairy goats.

3.2 The Location of the Study

The study was conducted in three divisions of three districts in Kenya. These were Bahati division of Nakuru North district, Kiharu division of Murang'a North district and Abothuguchi East division of Meru Central district. These areas were selected because they have high population density and have experience with dairy goat projects for over 10 years under different institutions. They also lay within similar agro ecological zones with almost similar infrastructure and socio-cultural characteristics.

3.3 Population of the Study, Sampling Procedures and Sample size

The target population of the study comprised of all smallholder farmers in the three districts, the accessible population consisted of about 248,000 (GoK, 2001b) smallholder farmers in the 3 divisions and 8 extension workers in these areas. The provinces, districts and divisions were purposively selected in order to build a sample that was satisfactory to the researcher's specific needs to meet the objectives (Cohen and Manion, 1989). The smallholder farmers were stratified into 2 strata and the groups were considered as clusters. According to Kaewswonthi and Harding (1992), a sample size of 100 for a population size of over 10,000 would have been appropriate, but due to the nature of the study, the objectives, the heterogeneity of the population and the method of data analysis and to cater for natural attrition a higher sample size of 150 was considered. A list of all dairy goat groups in the three divisions was compiled and one intact group and all members of such a group were interviewed (Frankfort-Nachmias and Nachmias, 1996) and Peil (1995). Non-group members of 25 farmers were also selected by systematic random sampling giving a total of 50 farmers per division.

3.4 Instrumentation

Questionnaires were used to collect data. They were found suitable since they collect primary data, which was necessary for the survey research. Questionnaires were in two sets, set one for smallholder farmers which sought information on socio-economic and technology transfer factors influencing adoption of dairy goats, set two for extension workers used to supplement the questionnaire for smallholder farmers on the influence of technology transfer factors on adoption. The instrument was tested for validity and

reliability by pilot testing and use of the Cronbach's coefficient Alpha formulae which gave the reliability as 0.9141.

3.5 Data Collection

Authority was sought from Division of Research and Extension of Egerton University, Egerton University's Graduate School and Ministry of Education, Research, Science and Technology for data collection. Questionnaires were administered in two ways, (1) Self-administered and (2) Researcher administered questionnaires.

3.6 *Data Analysis*

The data was analysed by the use of Statistical Package for Social Science (SPSS) version 11.5. Percentiles and frequency distribution tables were used to establish trends. Inferential statistics of multiple regression analysis were used and inference made at a 0.05 level of significance. It was used to determine the influence of the independent variables on a formulated composite adoption index and to assist the researcher to generalize the results from samples to populations by use of hypothesis testing (Mugenda and Mugenda, 1999). Multiple regression analysis also provided information on prediction of the independent variables on the dependent variable by use of the regression formula,

$Y=B_0+B_1X_1+B_2X_2+\ldots\ldots\ldots\ldots B_kX_k+ e$

A summary of data analysis is as shown in table 1

Table 1: Summary of data analysis.

Hypothesis	**Independent Variables**	**Dependant Variable**	**Statistical Method Of Analysis**
H_{O1} There is no significant statistical influence between farmers socio-economic factors and adoption of dairy goats	Socio-economic factors • (Age of HH in years • Gender of HH • Level of Education of HH • Number hours of available farm labour • Family annual total farm income)	Adoption Index derived from: • Number of dairy goats owned presently • Number of practices adopted among breeds and breeding, improved housing, feeds and nutrition, kidding, management and husbandly practices, milking and goat heath. • Length of time of keeping dairy goats measured in years.	Partial Multiple Regression analysis Frequencies tables and percentiles

Ho_2 There is no significant statistical influence between Technology transfer factors and adoption of the dairy goats.	Technology transfer methods • (Mass • Individual • Group • Extension agents education and experience • Sources of information)	Adoption Index • (Number of dairy goats owned presently • Number of practices adopted among breeding, improved housing, foliage and nutrition, kid rearing, husbandly practices, milking, goat health and records keeping. • Length of time of adoption measured in years.	Partial Multiple Regression analysis Frequency tables and Percentiles
	A combination of socio-economic factors and technology transfer factors	Adoption Index)	Full Multiple Regression analysis

3.6.1 Construction of Adoption Index

A composite adoption index was derived from computing the number of dairy goats adopted (NDGI), number of dairy goat packages adopted (NDGPI), and longevity of keeping the dairy goats (LTDGI) uses the following formula:
Adoption index = ((NDGI) (NDGPI) (LTDGI)) $^{1/3}$
It was raised to power 1/3 since the adoption index was constructed from the three variables and was expected to lie between 1 and 4. It was useful to the study since several independent variables were used to explain the dependent variable (adoption index).
Results indicated that 28% of the respondents were ranking at low adoption while 41% were at medium adoption.

4. Findings

The study interviewed a total of 147 respondents of a possible 150 targeted giving a 98.7% achievement of respondents.

4.1 Objective 1; Analysis of farmers' characteristics

Descriptive analysis of farmers' age in the 3 districts revealed that more than half of the farmers are aged between 20-50 years (82 farmers) and 58 farmers were aged over 50 years. This indicates that most farmers in dairy goat farming are middle aged. Gender analysis revealed that females were 33% and males were 67%. These results indicate that

there are more males than females in dairy goat farming in the study area. The analysis of educational level of household head in the three districts indicated that of a total of 145 farmers, 23 farmers in the study area had no education, 76 farmers had primary education, 35 had secondary education and 3 had tertiary education. These results indicate that most dairy goat farmers in the study area are of primary school level. Analysis on average annual income indicates that 107 farmers in the study area earned less than KShs 30,000. Only 5 farmers earned more than KShs 70,000 indicating that most farmers in dairy goat farming earned less than KShs 30,000 annually. Time factor analysis indicated that an average of 88 farmers in the study area spent 2-3 hours per day working on the dairy goat activities.

4.2 Objective 2; Characteristics of Dairy Goat Technologies Promoted to the Farmers.

This study examined eight basic dairy goat technologies promoted to the farmers in the study area. These included improved housing, foliage and nutrition, breeding, goat health; kid rearing, milking, husbandry practices and record keeping. The study was concerned with the number of packages adopted by the farmers. Results indicated that 88 farmers of the respondents had adopted below 4 packages, 6 had adopted 0 packages and 6 had adopted all the 8 packages.

4.3 Hypothesis 1; Analysis of the Influence of Socio-Economic Factors on the Adoption Index.

A partial regression analysis was undertaken. The coefficient of determination (R-square) measures the proportion of variability in a data set that is accounted for by a statistical model and the results are shown in Table 2.

Table 2: Partial Regression Test for Socio- Economic Factors.

Model	R	R Square	Adjusted R Square	F	P-Value
1	.525(a)	.276	.226	5.492	.0001

Regression Model Coefficients

Variables	Unstandardized Coefficients		Standardized Coefficients	t	P-values
	B	Std. Error	Beta		
(Constant)	.721	.528		1.366	.175
Age (years)	.004	.008	.048	.480	.633
Primary education 1=yes, 0=no	-.005	.258	-.002	-.018	.986

Secondary education 1=yes, 0=no	-.699	.326	-.300	-2.144	.034
Tertiary education 1=yes, 0=no	1.132	.675	.151	1.677	.097
Total Income (Kshs)	1.325E-05	.000	.454	5.057	.000
Hours working on the farm for dairy goat (#)	.174	.055	.279	3.158	.002
Gender of the Head/Decision Maker 1=male, 0=female?	.322	.188	.153	1.711	.090

a Dependent Variable: Adoption index

The results indicated that the socio economic factors account about 30% of the adoption-index and that socio economic factors are statistically significant at 5% level of significance since the P- value is 0.001. The order of factors influencing adoption index positively was given by the standardized coefficients (Beta wt) as total income, time spent on the farm on dairy goat activities, gender, tertiary education and age in that order. Primary education and secondary education were found to influence adoption negatively. These results indicate that the higher the total annual income, available farm working hours, the higher the adoption index. Gender was coded as male =1 and female=0. Since the coefficients for gender are positive, we conclude that males tend to have higher adoption index than females in the three districts.

However only total income and time spent on dairy goats were found to be positive and statistically significant while secondary education was found to influence adoption negatively and was statistically significant at 0.05 level of significance. These results indicated that a unit increase in total income and time in hours spent on dairy goats on the farm would increase the adoption index by .454 and .279 units respectively while every unit increase in secondary education as compared to no education decreased the adoption index by .300 units. The F-test was significant at 5.492 at 0.05 level of significance. We therefore reject the hypothesis that there is no statistical influence of farmers' socio economic factors on adoption of dairy goats and their technologies.

4.4. Hypothesis 2; Influence of Technology Transfer Factors on the Adoption Index.

Regression for Technology transfer factors indicated that R- square was 0.052 indicating that the technology transfer factors on their own contribute 5.2% to the adoption index. Technology transfer methods were measured as binary variables 1= yes otherwise 0. Mass media method, availability of extension workers and information sources were found to positively influence adoption of dairy goats. Group method and Individual methods were found to negatively influence adoption. However none of the technology transfer factors were found to be statistically significant.

4.5 Hypothesis 3; Influence of farmers' socio-economic and technology transfer factors on adoption index.

A full regression analysis was undertaken in order to find out the influences of the combined socio-economic and technology transfer factors on the adoption index. The results are as stipulated on Table 3.

Table 3. Influence of the Combined Factors on the Adoption Index

Mode	R	R Square	Adjusted R Square	F	Pvalue
1	.604(a)	.365	.275	3.628	.0001

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.181	.603		.299	.765
	Group method	.197	.296	.067	.665	.508
	Individual method	-.409	.198	-.198	-2.067	.042
	Availability of extension worker	.017	.316	.005	.054	.957
	Mass Media	.536	.240	.239	2.237	.028
	Availability to source of information	.130	.237	.052	.551	.583
	Gender	.473	.192	.233	2.468	.016
	Age	.006	.008	.086	.822	.413
	Income	1.648E-5	.000	.588	5.759	.001
	Primary education	-.046	.249	-.024	-.185	.854
	Secondary education	-.575	.322	-.260	-1.785	.078
	Tertiary education	.941	.644	.138	1.460	.148
	Hours working on the farm for dairy goat	.130	.058	.222	2.252	.027

a Dependent Variable: Adoption index

a Predictors: (Constant), Hours working on the farm for dairy goat, Tertiary education, Age, Availability of extension worker, Gender of the Head/Decision Maker, Primary education, Total Income, Individual method, Availability to source of information, Group method, Mass Media, Secondary education

Results of the full multiple regression model coefficients for socio-economic and technology transfer factors indicated that R- square = .365 indicating that both the socio-economic factors and technological factors contribute approximately 40% to the adoption index.

The full regression identified nine factors which positively influenced the adoption index. The full regression analysis identifies gender as statistically significant which was not previously identified in the socioeconomic analysis. These factors in order of importance are income, mass media, and gender, time in hours, tertiary education, age, group method, availability of information and availability of extension workers. However, socio-economic factors of income, gender, and time in hours and technology transfer factors of mass media were found to be positive and statistically significant. Secondary education and individual methods of training were found to be negative and statistically significant on the adoption index. The full regression analysis is statistically significant at 5% significance level since the F value is 3.628 and P-value is .001 indicating that the combination of socio-economic factors and technological factors significantly influenced the adoption index. We therefore reject the hypothesis that there is no statistical significant influence of socio-economic and technology transfer factor on adoption of dairy goats in Nakuru North, Muranga North and Meru central districts of Kenya.

5. Summary and Conclusions

5.1 Summary

Average annual income, mass media methods of extension, gender of the household head and time availability to work on dairy goat activities on the farm were found to be the most influential factors on the adoption index.

5.2 Conclusion

Socio-economic and technology transfer factors were found to influence adoption of dairy goats and dairy goat technologies since 28% of the respondents were ranking at low adoption while 47% were at medium adoption. Four factors of income, mass media, gender, and time available to work on the farm were found to be positive and statistically significant and can be used in the prediction of adoption. These factors should therefore be considered in dairy goat project designs, implementation and dissemination strategies in order to raise the adoption index.

6. Recommendations

1. Suitable policies to be put in place to provide an enabling environment that favors small scale farmers especially on issues of improving farm income and gender mainstreaming issues.
2. Consideration of mass media as a favorable extension method and information source.
3. Gender mainstreaming to be considered in dairy goat projects designs and strategies.
4. Consideration of educational levels in dairy goat project designs, implementation and disseminations especially in the study area.
5. Financial institutions can use income as a predictive factor to provide loans to small scale farmers.

7. Practical Implications and Value:

These findings provide predictive factors that influence adoption and will be important to policy makers, project designers', researchers and extension agents in the improvements of the dairy goat project designs, implementation and dissemination strategies on improving adoption of dairy goats and their technologies.

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