

KUJENGA MAISHA EAST AFRICA-KUMEA



Project Completion Report for Igembe Dairy Goat Livelihoods & Agroforestry Project Phase 2



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1.0 EXECUTIVE SUMMARY

Igembe Dairy Goat and Agroforestry project phase 2 was initiated in October,2018 and expected to end in October,2020. The project had the following objectives

1. Improve livestock and milk production for increased income and livelihood support
2. Improve environmental protection and soil fertility through agro-forestry promotion;
3. Improve access to dairy goat products through promotion of value additions

The project has been under implementation for more than the 2years anticipated due the emerging of COVID-19 hence the project secured a no cost extension up to end of February ,2021. The project has been able to achieve all the targeted milestones and enhanced replication of the same to other communities. The project was off-shoot of phase1 which did not achieve much due to poor implementation approach.

The current project was implemented with close collaboration and support of the local county livestock department and also coordinated by extension officer hired by the project.

The project was able to scale up implementation based on the lessons learned in the previous project. A series of capacity building sessions were carried to improve the farmers' capacity to manage the dairy goats. Exchange and study tours were organized and carried out to facilitate better understanding of dairy goat rearing. The identification and selection of the Dairy goats breed was carefully undertaken to promote better performing breeds and reduce livestock mortalities due to poor breeds.

Due to utilization of multiple strategies and effective capacity building the project has been successful and achieved its mandate with key lessons learned for future development and adaptation. Documentation of all capacity building proceedings have been achieved and sessions with relevant groups.

The project has met all the planned outputs and activities as per the project plans. Also the project impacts have been realized by the target farmers. The key achievement of the project has been the replication process through the Pass-On of Dairy goats to the 2no. new groups. Mwenda Akoi Women grouped passed on 30 dairy goats (24 doers and 6bucks) to Kamanu women group. Also Makena Kathengene Women group passed on 21Dairy goats (16does and 5bucks) to Wendo Mwega Women groups. Both groups that received have been oriented on animal husbandry management to enable them scale up effecting rearing and management of the Dairy goats to reduce mortality and morbidity rates.

The report provides implementation overview, key success factors, achievements and impacts realized. Key recommendations and way forward are highlighted. The project has various lesson learnt which will be useful in implementation of similar projects in the country.

2.0 Community mobilization & Engagement for Groups selection & identification

At commencement of the project the KUMEA Program management team organized a project orientation workshop with local leaders. The purpose of the workshop was to introduce the project to the community and discuss the objectives with view of engaging leaders and also develop criteria for partnership with community groups. The outcome of the workshop was as follows

- a) Identification of the groups to be engaged by the project and agree on the criteria for project implementation
- b) Identification schools to be engaged in project implementation and their key roles
- c) Agree on Community participation modalities of the project
- d) Understanding of the project objectives, activities, outputs and key outcomes

Based on the workshop outputs 2no. women groups were identified for project participation

Group	No. of members	Key activities
Gathangeni-Makena Women group	30	Merry-go round and farming
Akui-Mwenda Women group	30	Merry-go round and farming

The groups were tasked to undertake the following key activities

- a) Sensitize group members on the project plans and requirements for individual participation
- b) Register members and contribution of kshs. 5,000(five thousands) for revolving fund
- c) Mobilize members for the construction of the dairy goats stable and shed

The identified schools were tasked with the following key activities

- a) Formation of the school environment clubs
- b) Identify sites for tree nurseries development
- c) Identify key teachers to coordinate the school environment activities

A dairy goat house should:

- ✓ Be simple and of local materials as much as possible.
- ✓ Be built using a plan provided by the Department of livestock Development.
- ✓ Well ventilated for good air circulation
- ✓ Well roofed – Corrugated iron sheets/ polythene papers or grass thatched.
- ✓ Should be built against the wind direction.
- ✓ In well-drained soils.
- ✓ Have a slatted floor of 3x3 inches timber with 1 inches gap to allow dung pass through.
- ✓ The floor should be raised 2 feet above the ground.
- ✓ Should have several compartments as per the age groups – Buck, Doe, and kids
- ✓ The house should provide facilities such as- sleeping area, walking area, water and feed troughs and a mineral box.
- ✓ Be easy to clean and maintain good hygiene always.
- ✓ Apply used motor oil to the unit timber against wood weevils on yearly basis

3.0 Procurement of the Dairy goats

Through liaison with local livestock department the project agreed on the type of breed of dairy goats and the source of procurement. The type of breeds agreed for the does was the German /British Alpine and the bucks- toggen burg

The selection of this type breeds was based on the following key factors

- a) The breed resistance to diseases
- b) The regions altitude
- c) Ease of breeding
- d) The purpose of integrating the breeds was to ensure quality breeding of the Dairy goats and to ensure breeds that are able to cope with the environment and enhance high milk production.

Based on competitive bidding process the Dairy Goat of Kenya Association won the tender to supply the Does- German /British Alpine and Meru Dairy Goat Breeders secured the tender to supply the Bucks - Toggen burg

The following are the no. of breed supplied to each group

Group	Does- German /British Alpine	Bucks -Toggen burg	Totals
1.Gathangeni-Makena Women group	60No.	30No.	90No.
2. Akui-Mwenda Women group	60No.	30No.	90No.
Totals	120No.	60No.	180No.

4. Capacity building of target farmers group

Various capacity building sessions were carried out in the project with objectives of enhancing the groups capacity to manage effectively the dairy goats. The following are the various capacity building sessions carried out for the groups

4A) Animal health and Veterinary services

The training was to enhance capacity of farmers to enhance and promotion animal health and improved veterinary services. The training developed farmers' skills and attention towards improved animal health especially identification of disease and appropriate actions to be taken. Also, how to reduce morbidity among the Dairy goats by ensuring provision of appropriate feeds and supplements. Also encouraged farmers to liaise with sub county livestock office for any support required and ensure sustainable management of the goats at all times.

The following are the key out puts and outcomes of the training

- i. Every farmer should know the minimum feed and nutritional requirements of a goat.
- ii. The participants should be able to know some of the animal diseases (especially zoonotic ones), their signs & symptoms and some of the first aid/simple treatment procedures they can carry out at the farm level
- iii. Each farmer at their respective homesteads should ensure general hygiene maintained inside and outside the goat sheds such as avoiding dampness in those areas. In addition, do activities such as hoof, horn trimming will be done repeatedly
- iv. Proper record keeping at the farm level to be a routine
- v. Minimize kid mortality will to a very low level while high prolificacy to be encouraged and maintained.

4B) Training of Community Animal health workers

The training of community health workers has been meant to scale up livestock management at the grass root level to ensure the farmers group are getting adequate support from the community resource person at the village level therefore enhanced effective management and support for Dairy goat farmers. The impact realized has been reduced morbidity and mortalities for Dairy goats hence effective support for farmers' groups in dairy goat management.

The following are the key outputs and outcomes

- i. Farmers to improve on cleaning of the compound and animal sheds
- ii. Ensure timely vaccination of dairy goats
- iii. Provide adequate feeds for the Dairy goats on timely basis
- iv. Proper hygiene needs to be maintained before and after milking
- v. Report any serious illness of the goat to the local veterinary officers for prompt action

4C) Feeding and breeding management

The farmers group were trained on feeding and breeding management to ensure the take care of the dairy goats and integrate modern methods in rearing the goats.

The groups were provided with practical skills to enhance feeding and breeding of dairy goats.

The following are the key action points that come out of the training

- i. Farmers should be able to name various breeds of goats using their various distinctive traits
- ii. Each and every farmer properly understands the breeding process and how best they can use the knowledge to increase the herd size and also maximize on profits commercially
- iii. Participants understand and appreciate how an ideal goat should be like and how to be constructed
- iv. The farmers should be able to learn and appreciate different types of animal feeds and how they their various ration combination can lead to maximum production by the goats and also use that information practically at the farm level

- v. Participants should also replicate the knowledge acquired about how to establish the pasture in the field to curb the problem of animal feeds during the dry seasons of the year.

4D) Agroforestry and modern farming methods

Farmers were oriented on agroforestry and modern farming methods to facilitate fodder production for the animals and also diversify to other farming options for improved livelihoods. The need to integrate agroforestry to dairy goat rearing is based on enhanced production of feeds and promote adequate catchment with enhanced soil fertility. The agroforestry and modern farming were extended to the target schools with view of integrating the 4K clubs in promotion of agroforestry and modern farming methods at school and also replicate the same in the respective villages. Key action plans developed to facilitate implementation of agroforestry & modern farming methods in schools and with relevant groups. Key actions recommended are as follows

- i. Farmers were obliged with the task of replicating what they had learnt in the training to their respective farms and homesteads; example was building simple gabions & terraces, intercropping amongst other practices
- ii. The farmers were each tasked with an assignment of recruiting at least one person from their locality and make sure they enlighten them on the importance of agro forestry and also adopt the behavior of planting at least ten trees per rainy season
- iii. Farmers groups were obliged to prepare seedbeds at their respective areas
- iv. Apart from the tree seedlings provided by KUMEA, individual farmers were supposed to plant at least 10 trees to be an extra source of goat fodder and also to act as wind breakers amongst other benefits
- v. The farmers were tasked the responsibility of all the routine management practices required in the nursery until the tree seedlings attained the age of sale & transplanting

4E) Training on Value Chain Addition

The purpose of the training was to help farmers develop diversification of products to improve their incomes and livelihoods through value -addition and other enterprise modalities. Therefore, farmers' groups were taken through various value addition process and the following are the key outputs and outcomes of the workshop

- i. Together with the trainers, the dairy goat farmers resolved that it was important for creating more awareness and promotion of nutritional benefits of goat milk. This was important because through promotion and creating awareness the value of goat milk market & product expansion.
- ii. They also resolved to focus on the brand building which would not only make the marketing of the milk products much easier but also it would assist their products to fetch higher market prices.
- iii. Participants highlighted the need to have a strong information base because this would make them up to date with the current market trends
- iv. They also agreed to increase their production as well as reduction of losses so that they could be able to have enough product to meet the market demand.
- v. Participants realized the need for funding from the government both at national and county levels to increase their production levels and linkages with well-established firms /institutions to increase the marketing of their products

4 F) Marketing and marketing linkages

The purpose of the training was to help farmers improve marketing of the various dairy products produced. The farmers taken through various marketing strategies and targeting of consumers

- i. Together with the trainers they analysed key marketing principles and how they can integrate them
- ii. They also learned about the key aspects of rationale of marketing and the benefits
- iii. Better understanding of marketing concepts and process
- iv. Key marketing interventions and means to achieve effective promotion of various products

4G) Study tour

The farmers were taken for study tour in Nyeri County to share experience in goat rearing and management. The purpose of the study tour was to learn effective management of dairy goats and experience the performance of farmers in addressing the various challenges. The team learned a lot in terms of the following key areas

- i. The organization capacity of the groups and they support provided to farmers
- ii. Effective breeding and management of dairy goats
- iii. Linkages with the National Dairy Goat Association and the marketing process
- iv. Various feeds preparation process
- v. Milk production

The following summary provides a list of the various training under taken during project implementation process

Type of training	Dates	No. of participants			Key outcomes
		Men	Women	Totals	
1. Animal Husbandry Management	25 th -28 th March,2019	9	48	57	Improved management of Dairy goats by target farmers
2. Feeding & Breeding Management	21 st Jan.,2018	13	38	51	Improved capacity for dairy goat rearing
3. Agroforestry & Modern farming	25 th -26 th Feb.,2020	10	37	47	Scale up and utilize organic fertilizer for agriculture production by target farmers
4. Training on Value Chain	July,2020	5	24	29	Diversify production of milk products for improved livelihoods
5. Animal Health & Veterinary Services	25 th Nov,2019	10	47	57	Action plans for improved care of Dairy goats & reduced morbidity
6. Marketing & Marketing linkages	August,2020	11	42	53	Developed capacity for marketing of milk products
7. Study Tour	October,2020	3	27	30	Experience sharing & learning from other farmers groups
8. Orientation of animal husbandry management for pass –on groups	2 nd -3 rd February, 2021	10	41	51	Improved capacity & scaling up for new groups in management of Dairy goats
Totals	8	71	304	375	

5.Promotion of Agroforestry and Organic Farming Methods

Agroforestry is major component of the due its value in agriculture and livestock development. The rationale for integrating agroforestry and modern farming methods into the project was to enhance effective food production with strong linkages to Dairy goat production. The following are the key factors for agroforestry;

- i. Control runoff and soil erosion, hence reducing losses of water, soil material organic matter and nutrients.
- ii. Maintain soil organic matter and biological activity at levels satisfactory for soil fertility. This depends on the proportion of trees in the system normally at least 20% crown cover of trees to maintain organic matter over systems as a whole.
- iii. Agroforestry can provide a more diverse farm economy and stimulate the completely rural economy leading to more stable farms and communities. Economic risks are reduced when systems produce multiple products.
- iv. Nitrogen fixing trees and shrubs can substantially increase nitrogen inputs to agroforestry system
- v. Development and provision of fodder for dairy goats and other animals

Organic farming methods also add value to improvement of agriculture production and development. The following are the key factors for integration of organic farming methods

- i. **Promotion of Biodiversity**
Crop rotation to build soil fertility and raising animals naturally helps promote biodiversity, which promotes greater health across all living species. As organic farms provide safe havens to wildlife, local ecosystems also improve.
- ii. **Reduction of Farm Pollution**
While “farm smog” is not real, traditional farming does create its own forms of pollution with respect to runoff from synthetic fertilizer and chemical pesticides, which harm the surrounding areas. That runoff seeps into the local groundwater supply. As harmful chemicals are eliminated from use through organic farming, the environment benefits. Organic farming improves the soil, removes the risk of groundwater pollution and rehabilitates soil in areas where damage to water supplies has already occurred.
- iii. **Better-tasting Food**
It’s not your imagination: organic food truly tastes better than products that come from conventional farms and methods. Organic produce tends to have lower nitrate content than non-organic varieties, leading to fruits that not only taste sweeter but also have higher antioxidant levels. Science shows that organic farming isn’t just tastier but better for you, too!
- iv. **Fewer Environmental Toxins**
At present, less than one half of one percent of farm acreage in the Kenya is devoted to organic farming methods. This means that there are over 1 million acres of farmland being treated with chemical fertilizers, pesticides, and other toxic substances required by livestock farming. As the percentage of organic farms increases, the environment also benefits.
- v. **Better Soil Quality**
According to research done by Cornell University, forty billion dollars are lost annually due to topsoil destruction caused by conventional farming’s dependency on chemical fertilizers. If those fertilizers and ammonia were replaced by the use of organic farming methods, topsoil health would improve. The healthier soil would in turn produce vegetables and fruits with higher amounts of minerals and micronutrients.

- vi. **Helping in the Fight Against Climate Change**
Organic farming reduces the use of nonrenewable energy, because it avoids the use of chemical pesticides and fertilizers, which require large amounts of fossil fuel to produce. Organic farming also returns more carbon to the soil, which then lessens the greenhouse effect and global warming.
- vii. **Preservation of the Culture of Agriculture**
Around the world, every culture has at least one thing in common: food. Organic farming celebrates biodiversity and good health, and it removes harmful toxins from our environment and from our food. That is something to encourage and celebrate!

6. Replication process through Pass –on and Provision of Dairy Goats to other Groups

The project managed to replicate by passing on Dairy goats to other groups. The process of passing over the goats to other groups happened due to the effective management of the dairy goats by the initial groups. The groups were giving out the offspring of their initial dairy goats received.

The project through the project officer and the local livestock officers identified 2no. groups to benefit from the pass on process. The criteria for identifying the groups to benefit was based on the following key factors

- i) He/she has to construct a stable to serve the purpose of a good housing and has to be constructed as per the plan issued by the sub-county livestock office
- ii) They have to contribute the full amount of five thousand to the group or revolving fund before being issued with a goat. This will act as one of the parameters of measuring the member's seriousness towards the initiative.
- iii) The member selected also has to be active in all the activities carried out by the group and confirmed by all officials and group records.
- iv) Also as an individual, the member has to agree to do the pass on when they called upon without hesitation
- v) Each member also has to agree to the terms and conditions that are associated with the dairy goats rearing. To do so upon issuance they will sign a contract give to them by KUMEA.
- vi) Members must have adequate pasture and be prepared to engage in agroforestry for fodder production and improvement
- vii) Selected members must be willing to participate in capacity building sessions and training on cost-sharing basis improve their capacity in Dairy goat rearing and management

The following table provides details of the groups that benefitted from the pass on process of the dairy goats

GROUP PASSING OVER GOATS	GROUP RECEIVING GOATS	NO. OF FARMERS	NO. OF DAIRY GOATS PASSED ON			PASS ON VENUE
			DOES	BUCKS	TOTAL	
1. Mwenda Akui Women group	Kamanu Women group	30	24	6	30	Akui Chief Camp
2. Makena Kathangene Group	Wendo Mweiga Women Group	21	16	5	21	Athiru PEFA Church
Totals		51	40	11	51	

7.0 Key Success Factors and Achievements

7.1 Good criteria for allocation of Dairy goats to group members

The success of the project has been attributed the criteria for allocation of Dairy goats to respective members. The demand for construction of the Dairy goat stable/shade, payment of Kshs.5000 revolving fund and willingness to participate in various capacity building sessions contributed to the commitment and effectiveness of the selected farmers thus enhancing effective management of the dairy goats.

7.2 Good Breed Selection and Healthy Goats

The selection of the Dairy goats breeds for the farmers group has been commended by the groups. The breeds have been able to mature faster and also resistant to livestock diseases thus making them easy to maintain. The morbidity ratios are lower as compared to the previous project. The project identified the Alpine Does and Toggen burg bucks have proved to adaptable to the various community groups. Currently most the goats have been rated as healthy and other community members admire the group members are demanding to join the groups to benefit from the dairy goats also.

7.3 Proper Design of the Goat stables/shades

The project provided a standard design for the construction of the stables by all the farmers. The construction of the Dairy goat stable was mandatory criteria before consideration for support. Therefore, farmers have appreciated the design for the stable as very suitable for healthy upkeep of the dairy goats. The stables make it easy to feed the dairy goats and prevent the animals from getting infected by livestock diseases.

7.4 Adequate capacity building and extension support

The various capacity building sessions implemented by the project has adequately prepared farmers in enhancing effective management of dairy goats. Farmers have been trained on various key issues ranging from Animal husbandry management, Feeding & breeding, Animal health & veterinary, Community Animal health support, Marketing and marketing linkages and Value chains. The training facilitated by the livestock officers was adequate and gave farmers adequate information and skills. The extension support by the Project Officer also played a major role in adaptation and follow ups of the various action plans developed for effective extension support.

7.5 Production of organic fertilizer to enhance Vegetable farming and fodder production

The production of organic fertilizer and manure from the waste of the dairy goats enhanced utilization of the manure in the vegetable gardens for vegetable production and fodder production. The fertilizer production has facilitated farmers to be engaged in vegetable production thus enhancing their livelihoods. Production of fodder has supported the farmers in ensuring adequate feeds availability from their own farms hence promoting sustainability in feed production.

7.6 Milk production from the Dairy Goats as Source of livelihoods

The target farmers have been able to secure at least 1-2 litres of milk from each dairy goats. The milk production has created additional income and livelihoods for the farmers. Also farmers are able to save money since they have milk at their disposal rather buying milk for their use at households. Milk production has enhanced good health among the farmers and their children. There is now need for the farmers to form a cooperative and market their milk for better prices and secure adequate cooling plants for storage of milk for long hours and reduce disposal of waste milk.

7.7 Promotion of hygiene at the stable shades and during milking

The farmers have adapted positive hygiene practices that have ensured the goats stable are clean and well maintained. The farmers have also been practicing hygiene during the milking of the goats and storage of the milk i.e. washing hands with soap and using clean containers to store the milk. The purpose of theses adaptations is to reduce the milk contamination and any other diarrhea diseases. This ensures milk is safe from milking up to storage and utilization.

7.8 Promotion of agroforestry and fodder production

Integration of agroforestry into the Dairy livelihoods project has enabled farmers to adapt and embrace agroforestry which has improved their farms and also improved fodder production. The farmers are able to grow trees & bushes that generate fodder for the goats i.e. Calliandra (*Calliandra calothyrsus* Meisn.) Calliandra is an N-fixing legume that roots abundantly and nodulates readily with *Rhizobium* bacteria. It yields high amounts of biomass and has been recommended for green manure in areas of low fertility. It can be used in rotation with cash crops like sugarcane or maize (in alley cropping systems). However, the high tannin content of the leaves reduces the microbial breakdown of organic matter in the soil. Integration of agroforestry has also led to improvement of soil fertility due to the leaves of the bushes/trees converting into manure to produce organic fertilizer.

7.9 Reduced morbidity and mortality rates for the Dairy Goats

Due to proper management of the dairy goats with good feeding arrangements and adequate care there has been less morbidity cases and diseases. Also the mortality rates are minimal due to good management practices by the farmers. Previous project had very high morbidity and mortality rates due to mismanagement and inadequate capacity building. This has been a positive attribute to the project and the target farmers.

7.10. Group Development and Expansion

The performance of the farmers in the respective groups has attracted admiration from the community members hence the demand to join the group and benefit from the project. The situation has led to high self –esteem by farmers who realize they are recognized for their effective dairy farming in the locations. This has been a positive impact that has led to multiple replication of project activities in the respective communities.

7.11 Replication capabilities of the project through pass on of Dairy goats to other groups

The project has been rated successful due to the replication potential of beneficiary groups being able to provide goats via pass on to 2 other groups. The process saw the 2no. groups –Mwenda Akui women group and Makena Kathangane women group pass on goats to Kamanu women group and Wendo Mweiga women group respectively. A total of 51 goats (40 Does and 11 bucks) were given to new set of 51 farmers. The implementation of this process is good indicator of good Dairy goat production and management. Therefore, the pass on process signifies the success of the project.

8.Key challenges noted

8.1 Gender Disparity

There is a challenge due to cultural norms in ownership of the Dairy goats especially during family conflicts. The Dairy goats are mainly owned by women in the women group but when there is a conflict the man may usurp the ownership of all the animals in the home hence mismanage the livestock. Therefore, there is need in future to undertake capacity building on gender roles and gender resource analysis training to reduce cases of Gender disparity & conflicts in management of livestock.

8.2 Inadequate support of County Livestock officers for extension services

Most farmers reported low response from the County livestock officers when they need support therefore resorting to using private livestock technician for technical support. They complained that the County livestock extension officers are few and overstretched hence not able to access the farmers in time of need. There is need for consultation with County Livestock Officer to streamline extension support services so that the farmers can access their services.

8.3 Inadequate funds mobilization for production of yellow maize production for Dairy goats' fodder

During capacity building sessions on feeding and breeding management the farmers were introduced to the various good fodder crops for the goats and the livestock facilitation team promised to arrange the provision of seedlings for fodder production. The production has not taken off due to the County government inability to secure funds to support farmers with the production of the yellow maize. There is need to carry out the production on pilot basis to assess its viability as fodder option for the Dairy goats.

8.4 Low Development and Adaptation to Value Chains additions initiative

None of the engaged groups have initiated value chain additions to enhance production of better milk products. The activity has not been done due to funds required to purchase the relevant equipment required i.e. Blenders and other machinery. The groups are limited financially and have not embarked on the processing of milk products.

9.0 Key Impacts Noted & Lessons Learnt

9.1 Improved record keeping for livestock management

Most farmers are now keeping records of their milk production and other documentation i.e. the time and day the kids are born. Also the monitor and document any medication given by the local veterinary officials. The positive attitude towards record keeping has enhanced their capacity and skills in documentation.

9.2 Effective use of manure from goats for sustainable food production and improved soil fertility

Promotion of organic farming has been realistic in the villages due farmers applying waste from goats as manure and fertilizer in their farms to enhance food production. The use of organic fertilizer from dairy goats' waste will improve soil fertility and promote sustainable food production. The farmers will save funds by using the organic fertilizer.

9.3 Adaptation of Agroforestry for fodder production & soil fertility

The integration of Agroforestry in the project has been able to facilitate fodder production and improve soil fertility. The leaves from the shrubs evolve into organic fertilizer while some of the agroforestry shrubs promoted are good fodder for the Dairy goats. The farmers are able to grow trees & bushes that generate fodder for the goats i.e. Calliandra (*Calliandra calothyrsus* Meisn.) Calliandra is an N-fixing legume that roots abundantly and nodulates readily with *Rhizobium* bacteria. It yields high amounts of biomass and has been recommended for green manure in areas of low fertility. It can be used in rotation with cash crops like sugarcane or maize (in alley cropping systems). However, the high tannin content of the leaves reduces the microbial breakdown of organic matter in the soil. Integration of agroforestry has also led to improvement of soil fertility due to the leaves of the bushes/trees converting into manure to produce organic fertilizer.

9.4 Improved lifestyles and livelihoods for households with Dairy goats

The household daily calendar changed with the introduction of Dairy goats at the households. Each household involved in the project can now have improved diet due to the availability of milk. The household members' sale part of the milk to secure income and also save in terms of finances for utilizing organic manure for food production. Also the production of fodder via agroforestry save them money for buying feeds for the goats. They only purchase dairy meal and salts for the goats.

9.5 Community prestige and Women Empowerment for Rural Development

The good achievement by the 2 women groups in the implementation of the project has promoted the role of women in rural development through Dairy goats' livelihoods, Improved farming and agroforestry. The role played by the women has transformed Women Empowerment and enhanced their prestige through high self-esteem. It has proved that women can be key to rural development transformation and create impacts in the communities. The pass on process of goats to other groups has facilitated project replication through increased access to livelihoods for more women through dairy goat rearing.

9.6 Poverty reduction through sustainable livelihoods

The project has been able to address poverty reduction by enhancing sustainable agriculture for food production and Dairy goats' livelihoods. Households have transformed their lives through access to organic fertilizer for use in food production. Selling of dairy goat milk and vegetable production has been proved to be a source of income at household level. Also the target farmers have been able improve their health and nutrition by accessing milk in their diet. Some community members have been visiting target farmers to learn about the improvement in livelihoods. The demand to join the groups is an effort by community members to seek viable poverty reduction mechanism in the community.

10.0 Way Forward and Key Recommendations

10.1 Develop a similar project with inclusion of other livelihoods components in the neighboring location

The project can develop a similar project with inclusive of other livelihood components i.e. bee keeping and be able to link up with the current groups as resource centers for enabling the new projects adapt their model. The old could provide adequate support in providing Dairy goats to the new projects at affordable price hence develop community capacity for sustainable development.

10.2 Marketing of livestock & products

The groups need to engage in development of value addition to broaden their income base and enhance source of livelihoods. There is also need to develop marketing strategy that will promote their products within Meru County and beyond so that farmers can benefit from various products developed.

10.3 Develop SACCO for improved production and create farmer support systems

The groups can merge to form a SACCO or integrate into existing SACCO to enhance their production and also develop adequate systems to support farmers to enhance their production. The SACCO could include sustainable food production i.e. vegetable and milk production. Develop markets and link up with supermarkets and other institutions for supply chains. The SACCO could enlist several farmers into the Dairy goat farming and livelihoods to enhance the income of the targeted farmers. They could produce products for export and be able to generate adequate funds for future development.

10.4 Groups to link up with International Fund for Agriculture Development (IFAD) for further expansion and integration

Currently IFAD is carrying out similar projects in the neighboring counties and the target groups could benefit from support of IFAD in expanding their Dairy goat farming and other livelihoods activities. IFAD can facilitate the setting up of Dairy plant for value addition and marketing of their products.

10.5 Adequate Extension Support Mechanism

Future project implementation should entail a formalized Memorandum of understanding with relevant County livestock office to support the implementation of the project. Situations where the farmer needs urgent support from the County Livestock Technical officer who are engaged elsewhere could be costly in terms of service delivery. It may force the farmers to deal with quacks who may not offer sufficient capacity where required.

Also the KUMEA Project Officer needs to be facilitated with motorbike to enable him traverse the project area with ease to give adequate support to the target farmers and also be able to attend various liaison forums and meetings with relevant stakeholders. Currently the project officer does not have effective transport to reach target farmers in time.

ANNEX 1: PROJECT IMPACT PHOTOS



1. Farmers using the manure from goats for organic farming –banana plantations, Mwenda Akui Women group



2. Utilization of manure from Dairy goats used for maize production, Mwenda Akui Women group



3. Well maintained Dairy goat stable with over 6no. goats for farmer from Mwenda Akui Women group



4. Farmer whose Dairy goat delivered triplets providing feeds Mwenda Akui Women group



5. Inspection of well-maintained dairy goat stables, Mwenda Akui Women group



6. Training farmers who have benefitted from replication process through pass –on of Dairy goats

ANNEX 2: PROJECT REPLICATION PROCESS-PASS ON PROCESS- WENDO MWEGA WOMEN GROUP RECEIVING DAIRY GOATS FROM MAKENA KATHANGENE WOMEN GROUP



1. Makena Kathangene women group bringing goats for pass on to Wendo Mwega group



2. Members of Makena Kathangene Women group with goats for pass on to Wendo Mwega group



3. Makena Kathangene women group pass on goats to Wendo Mwega women group



4. Makena Kathangene women group pass on goats to Wendo Mwega women group



5. Wendo Mwega women group with Dairy goats received from Makena Kathangene women group



6. Makena Kathangene women group pass on goats to Wendo Mwega women group

ANNEX 2: CONTINUED



7. Wendo Mwega women group with Dairy goats going to their respective villages



8. Wendo Mwega women group with Dairy goats going to their respective villages



9. Meeting with both groups and KUMEA staff to agree on the pass on procedures



10. Pass on of Dairy goats from Makena Kathangene women group to Wendo Mwega women group



11. Animal stable/pen belonging Monica Kamotho one of the beneficiaries of the dairy goat pass on process



12. Children at the homestead of Monica Kamotho participating in preparation of animal feeds for the dairy goat

ANNEX 3: PROJECT REPLICATION THROUGH PASS ON PROCESS-KAMANU WOMEN GROUP MEMBERS RECEIVING DAIRY GOATS FROM MWENDWA AKUI WOMEN GROUP



1. Project staff addressing both groups before pass on process begins



2. Chairperson of Mwendwa Akui women discussing with both groups in regards Dairy goats project impacts



3. Mwendwa Akui women group members with their goats ready for the pass on process



4. The two groups exchanging goats during the pass on process



5. The two groups exchanging goats during the pass on process



6. The two groups exchanging goats during the pass on process

ANNEX 3: CONTINUED



7. The two groups exchanging goats during the pass on process



8. Kamanu women group members with dairy goats received from Mwendwa Akui women group



9. Kamanu women group members with dairy goats received from Mwendwa Akui women group



10. Kamanu women group members with dairy goats received from Mwendwa Akui women group



11. Kamanu women group members with dairy goats received from Mwendwa Akui women group



12. Kamanu women group members with dairy goats received from Mwendwa Akui women group

ANNEX 4: GROUP PREPARATIONS FOR DAIRY GOATS PASS ON PROCESS



1. Initial meetings for pass on groups beneficiaries' identification process



2. Wendo Mwega women group member completed construction of the animal stable/pen



3. Inspection of the completed animal stable/pen for Kamanu Women group member



4. Completed animal stable/pen for Kamanu women group member



5. Construction of the animal stable/pen for Wendo Mwega women group member



6. Inspection of under construction animal stable/pen for Wendo Mwega women group member

ANNEX 5: DISTRIBUTION OF GOATS -Goats distribution for Akui-mwendwa members in the respective villages/households-30 group members



1.



2.



3.



4.



5.



6.

Goats distribution for Akui-mwendwa members



7.



8.



9.



10.



11.



12.

Goats distribution for Akui-mwendwa members



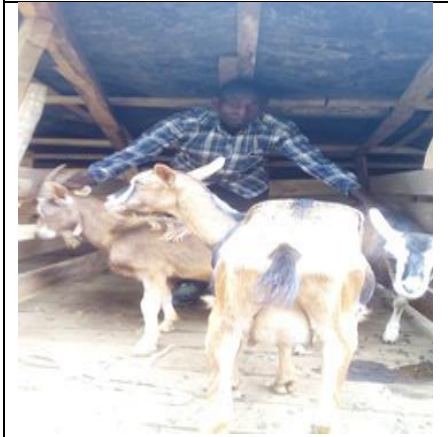
13.



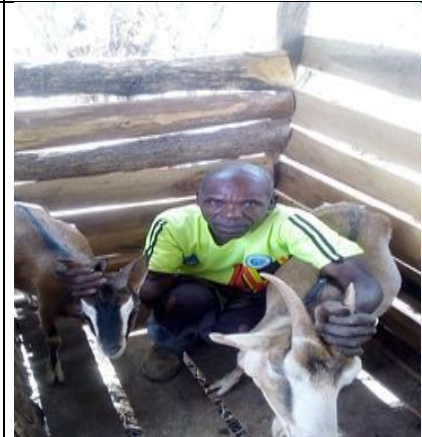
14.



15.



16.



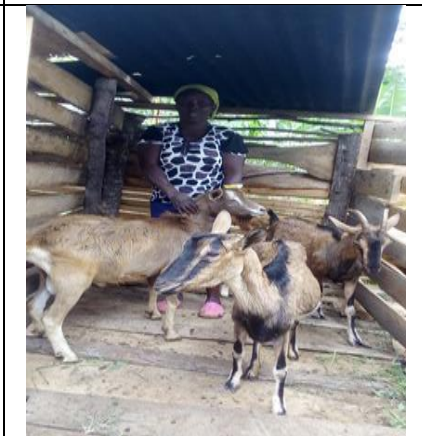
17.



18.



19.



20.



21.

Goats distribution for Akui-mwendwa members



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23.



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25.



26.



27.



28.



29.



30.

Goats distribution to Makena Kathangene group,30 Members –Nkiiri



1.



2.



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Goats distribution to Makena Kathangene group



10.



11.



12.



13.



14.



15.



16.



17.



18

Goats distribution to Makena Kathangene group



19.



20.



21.



22.



23.



24.



25.



26.



27.

Goats distribution to Makena Kathangene group



28.



29.



30.

**ANNEX 6: GPS COORDINATES FOR FARMERS LOCATION PER GROUP
WENDO MWEGA WOMEN GROUP MEMBERS & PROJECT BENEFICIRIES**

NAME OF FARMER	GPS COORDINATES	
	NORTHINGS	EAST
1.PAMELA NDANU	0.245549	38.058018
2.DORCAS NTHAMBI	0.293201	38.061319
3.HEELEN MWIKALI	0.187349	38.040237
4.HELLEN MWEENDE	0.187349	38.040237
5.AGNES KATHOMI	0.187349	38.040237
6.LINDAH KARAMBU	0.288770	38.056093
7.ZIPPORAH MWEENDE	0.315940	38.032785
8.NAOMI MUTHONI	0.228995	38.049534
9.RUTH MAKENA	0.209984	37.968674
10.JACOB KATHIA	0.249331	38.092450
11.PETER MAKAU	0.253883	38.101414
12.MONICCA KALONDU	0.254833	38.101414
13.SABINA KADOGO	0.254885	38.091057
14.SAMUEL NJERU	0.253062	38.088957
15.JOSHUA KIRIMI	0.256087	38.90522
16.GODFREY MURIUKI	0.255936	38.089193
17.MONICCA KAMOTHO	0.249782	38.089729
18.WINFRED MUTHOMI	0.251230	38.089458
19.ROSE SYOMBUA	0.252861	38.087573
20.ANN MAKENA	0.257029	38.094464
21.PURITY MWEENDE	0.246192	37.465590
22.REBECCA MUKOITI	0.287869	38.065457

GPS COORDINATES FOR KAMANU WOMEN GROUP MEMBERS & PROJECT BENEFICIARIES

NAME OF FARMER	GPS COORDINATES	
	NORTHINGS	EASTINGS
1.MARIAM INA KOBIA	0.212124	37.971394
2.SABINA NKOROI	0.211404	37.971420
3.PETER KUBAI	0.211663	37.971185
4.FAITH KATHONI	0.12441	37.58167
5.CHARITY THIRINDI	0.213585	37.971757
6.MARIAM KANJA NGORE	0.213807	37.971977
7.CHARITY KALULU	0.211791	37.9710890.
8.FRIDAH KAJUJU	0.211391	37.976581
9.JENIFFER KAJUJU	0.412857	37.970859
10.JOSEPH MEME	0.208690	37.975512
11.JENIFFER KANJA	0.399005	37.937401
12.CHARITY KARIANYONI	0.420121	37.973506
13.REBECCA THIRINDI	0.394470	37.950229
14.JAPHET KAIRI	0.211044	37.976926
15.RUTH MAKENA	0.209984	37.968674
16.PRISCA KAIMURI	0.214037	37.978552
17.LUCY MUKO MAUA	0.205462	37.971759
18.ROSEMARY KANJIRU	0.215756	37.977396
19.CATHERINE CIONCHIRU	0.210555	37.969219
20.MARY KITHUILI	0.211304	37.965206
21.GLADYS KARIMI	0.206717	37.966125
22.KANJIRA KAMAU	0.211348	37.969346
23.EVAGLYN CIOTIRI	0.206652	37.977124
24.STANLEY NGORE	0.206652	37.970975
25.PENINNAH MUTHENYA	0.209526	37.970590
26.ANN KARIMI	0.205387	37.970590
27.GLADYS KABUTIA	0.209988	37.970238
28.AGNES KANGAI	0.211754	37.950489
29.GRACE NCULUBI	0.212657	37.612403
30.MARIAM MAMI	0.387547	37.969652

GPS COORDINATES FOR MAKENA KATHANGENE FARMERS GROUP MEMBERS & PROJECT BENEFICIARIES

NAME	NORTHINGS	EASTINGS
1.REBECCA NKATHA	0.293251	38.064905
2.JULIA KAMENE	0.290270	38.057341
3.SABINA SYOMBUA	0.292350	38.062655
4.PRISCILLA KANANU	0.293294	38.065118
5.LUCY KINYA	0.292480	38.065397
6.PAUL KIRIMI	0.227696	38.019226
7.STANLEY NTOITHA	0.231447	37.943332
8.JOSEPH KARIUKI	0.290528	38.061026
9.MONICCA MUTHONI	0.293059	38.060961
10.EDDAH KAWIRA	0.292812	37.954160
11.SARAH KAMBURA	0.286326	37.966732
12.JOSPHINE MUKWERURI	0.284911	37.964921
13.ELIUD MUNENE	0.285836	37.964317
14.AGNES MUKWANJIRU	0.286855	37.967146
15.TERESSIA MWOKIRIA	0.285933	37.963995
16.STANLEY MBAE	0.285538	37.966388
17.ERIC MUTUMA	0.291921	38.067455
18.GLADYS KINYA	0.291406	38.061584
19.PETER MUSYOKA	0.290399	38.059342
20.JANE MWENDE	0.291749	38.066170
21.EUNICE KANANU	0.279402	38.803950
22.DORCAS KAGENDO	0.290838	38.072062
23.JOSHUA MUTHAURA	0.294240	37.755654
24.REGINA MUTUNE	0.284065	38.076987
25.STELLAH WANJIRA	0.293517	37.418330
26.SARAH KABERENGE	0.285973	37.621698
27.ELIZABETH NTIN'GA	0.294067	38.032785
28.JULIUS KINOTI	0.235474	37.854223
29.ALICE KANINI	0.245270	37.462350
30.LUCY KANARIO	0.292455	38.088280

GPS POINTS FOR MWENDWA AKUI WOMEN GROUP & PROJECT BENEFICIARIES

NAME	NORTHINGS	EASTINGS
1.ESTER NKATHA	0.210955	37.972691
2.FLORENCE KATHAMBI	0.211218	37.972473
3.MARY KAREA	0.211630	37.971383
4.DORIS KATHOMI	0.210708	37.972401
5.BEATRICE NKIRINA	0.211042	37.972835
6.ESTER KAOME	0.211021	37.972380
7.MARGET KAINDA	0.211514	37.971721
8.CATHERINE MUTHENYA	0.210935	37.972508
9.PURITY KAGWIRIA	0.211198	37.972503
10.ANITER MUKOMAU	0.211360	37.972492
11.MERCY GITARI	0.209484	37.974669
12.MARIAM KARIMI	0.209475	37.971939
13.JULIA KANGAI	0.212073	37.973228
14.ANN MUKOITI	0.211378	37.972542
15.ANGELINA KAREA	0.211067	37.972547
16.MONICCA KANANU	0.211102	37.972458
17.ANN KAGURI	0.211478	37.971374
18.HARRIET KAREMA	0.212204	37.972985
19.FLORENCE KAMAMI	0.211247	37.972638
20.JUNITER KARUKI	0.211464	37.973069
21.AGNES NCORORO	0.211057	37.972274
22.GLADYS KANARIO	0.211218	37.972473
23.REBECCA KARAUKI	0.211427	37.972328
24.CATERINA KANJIRA	0.211819	37.973228
25.JANET KAGWIRIA	0.211480	37.971433
26.CHARLES KIRIMI	0.211480	37.971433
27.FRANCIS MUGAA	0.211824	37.973227
28.ATENASIO MUGAMBI	0.211824	37.970966
29.JERUSHA NCORORO	0.211207	37.972327
30.MARION KAOME	0.211311	37.972453