



KENYA AGRICULTURAL AND LIVESTOCK RESEARCH ORGANISATION
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**INVENTORIZACION DE TECNOLOGIAS, INFORMACION & INNOVACIONES DESARROLLADAS EN KALRO - TIERRAS SECAS Y PASTIZALES
INSTITUTO DE INVESTIGACION, CENTRO DE INVESTIGACION KIBOKO PARA EL PERIODO 2009-2014**

November 2014

**Technologies, Information and Innovations in Ecology and Natural Resource Management Developed at ARLRI
Kiboko Research Centre From 2009-2014**

Technology/information /innovation name	Factors influencing adoption of Natural Pasture Improvement (NaPI) Technologies	Socioeconomic analysis of reseeding rangelands of Kenya	Utilization of traditional indicators for weather prediction in Pastoral systems	Essentials for effective pastoralists' wildlife conservation	Effects of conservation technologies on pastoral production Systems	Effect of conservation technologies on pastoral land ecology
Category (i.e. technology, information or innovation)	Information	Information	Innovation	Information	Information	Information
Technology description	Factors influencing adoption of natural pasture improvement (NaPI) determined	Social and economics (gross margin and cost benefit ratio) of improving natural pasture determined	Specific traditional indicators used to forecast weather	- Extend of changing pastoralists perception toward wildlife evaluated	- Effect of Community Wildlife Sanctuary on pastoral production determined	- Effect of Community Wildlife Sanctuary establishment on land cover, species diversity and richness determined
Justification (objective of technology)	Assess the social and economic factors that influence the adoption and diffusion of NaPI technologies for wider uptake and diffusion	<ul style="list-style-type: none"> -Higher demand for forage improvement materials. -Low adoption of reseeding technology -inadequate information on its socioeconomic -Lack of elaborate marketing systems of natural pasture products -Low priorities assigned to 	<ul style="list-style-type: none"> -Density of weather stations in Africa and especially ECA region low and inadequate -High temporal and spatial variability of weather in 	<ul style="list-style-type: none"> -Pastoralist view wildlife as liability - Passive participation of pastoralists in conservation - Change arising from lessons learnt 	<ul style="list-style-type: none"> - Optimize pastoral returns from livestock and wildlife - Scanty information on how wildlife conservation technologies affect pastoral livestock 	<ul style="list-style-type: none"> - inadequate information on ecological effects on pastoral areas of community Wildlife Sanctuaries - effect of CWS on land cover established

		range management and sown pasture by farmers and the government.	pastoral system - communities have used traditional lore for eons -Traditional lore on weather forecasting disappearing Fast	from earlier establishment assessed	production	
Region promoted	Makindu and Mashuru Sub-Counties	Southern rangelands of Kenya	Baringo, Tana North, Taveta subcounties in Kenya, Yabello in Ethiopia North West Tanzania	Laikipia, Kajiado Counties	Laikipia and Kajiado counties	Laikipia
Evidence of validation	Technical report LRRD Journal paper	-Technical report -KASAL end of project proceeding	-Bulletins -Conference papers	-Conference papers - Phd thesis	-Conference papers -- Phd thesis	-Conference presentation - Phd thesis -Feedback meeting minutes
Users of technology	Research/Universities institution Agro pastoralists and pastoralists	Research/Universities institution Agro pastoralists and pastoralists	-Agro pastoralists -Pastoralists	-Pastoralists	-Pastoralists	-Pastoralists
Approaches of dissemination	Training and feedback workshops FGDs	Training and feedback workshops FGDs	-Feedback meetings -Community meetings -Bulletins	-Workshops - Feedback meetings	-Workshops - Feedback meetings	- Exposure tours to successful establishments - Feedback meetings
Most effective approach	Training and feedback workshops	Training and feedback workshops	Community meetings	-Exposure tours	-Exposure tours	-Exposure tours
Critical/essential factors	Age and education	Social issues are sex, age	-Community	- Presence of	- Presence of	- Presence of

for successful promotion	level of household head, land ownerships and affiliation to farmers group(s) are factors to consider for a wider uptake and diffusion of NaPI technologies	and level of education of the head of the household Economic factors are size of the land and herd size	understanding of indicators in their area	wildlife - community support	wildlife - community support	wildlife - community support
Partners/stakeholder for scaling up	MoALF, NGO, CBOs	MoALF, NGO, CBOs	-Meteorology -NGOs -CBOs	- Extension Agents - NGOs - CBOs	- KWS - NGOs - CBOs - Extension Agents	- KWS - NGOs - CBOs - Extension Agents
Current extent of reach	Not estimated	Not estimated	NE	NA	NA	NA
Challenges in dissemination	Inadequate information on NaPI technologies	Inadequate quantity of range grass seed Informal marketing of grass seed	-Inadequate institutionalisation - Effects of climate change on indicators	-conservation politics -Inadequate policies -Inadequate community capacity - attitude toward wildlife - High start-up capital for wildlife enterprises	- Conservation politics -Inadequate policies - Wholesome adoption of conservation models	- Conservation politics -Inadequate data on ecological effects of technologies
Recommendations for addressing challenges	Research-extension linkage needs to be enhanced to facilitate information flow	Linking to KEPHIS for seed certification	- Institutionalization - development of database and continuous monitoring of	- All operation in CWS should be above board - Partnerships should be functional	- Develop policies and legal infrastructure to govern Community based Conservation	-Generate data to validate claims of conservation effects

			the indicators			
Lessons learnt	-To enhance adoption, farmers need more information on the benefits associate with of NaPI technologies - Participatory approach through establishment of demo plots for enhanced adoption	Intensive training on NaPI technologies, provision of grass seed and field days	-Communities consider traditional indicators more reliable - Some communities depend only on traditional indicators for weather forecasting - ITK knowledge is getting lost due to religious, education and generational change -Some communities have seers for weather forecasting	- Transparency enhances community trust	-Zoning of pastoral grazing areas for conservation not popular approach - some degree of CWS management flexibility to accommodate livestock minimizes conflicts	- Effect of CWS on Pastoral lands ecology depended on livestock access -CWS enhances degradation in livestock grazing areas.
Social, environmental and market conditions necessary	All gender to be involved from technology development	All gender involvement Formal market for range grass seed	- Acknowledgement and respect for indigenous technical knowledge (ITK)	-Enhanced community capacity -reduction of trade barriers - Improved security	Enhanced community capacity -reduction of trade barriers - Improved security	Enhanced community capacity -reduction of trade barriers - Improved security
Basic costs	Not Estimated	Average = KES 12,625.58 per hectare	NE	-Variable based enterprise type	-	Research funds

Estimated returns	Not Estimated	Average KES 94,052.10 per acre	NE			
Gender issues and concerns in development and dissemination	The men, women and youth should all be involved	The men, women and youth should all be involved	-Most of the youth disregard the ITK - Knowledge in the domain of only a few	- all gender to be involved	-all gender to be involved	all gender to be involved
Gender issues and concerns in adoption and scaling up	The men, women and youth should all be involved	The men, women and youth should all be involved	-The youth need to be educated on ITK on weather forecasting	Most women and youth	-Most women and youth do not own land	Most women and youth do not own land
Gender related opportunities	Target youth for quick adoption	Target youth for quick adoption	-Youth to identify with the ITK for sustainable resource use and conservation	-Successful community based wildlife enterprise benefit all gender in jobs and income	- A well-managed CWS would benefit all gender	- A well-managed CWS create opportunities for all gender
Success stories	NA	NA	Tana North experience where the community have one elder known across the Orma community as the seer on weather forecasting			
Application guidelines for users	Not Done	Not Done		ND	ND	ND
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Partner organization	Egerton University, Kenya.	-The University of Nairobi -South Eastern University College	-TALIRI, MABUKI Tanzania - OARI, Yabello , Ethiopia	-The University of Nairobi	-The University of Nairobi	-The University of Nairobi

Technologies, Information and Innovations in Ecology and Natural Resource Management Developed at ARLRI Kiboko Research Centre from 2009-2014

Technology/information/innovation name	Effect of land-use change from ranching to smallholder farming in ASAL	Carbon sequestration assessment in grasslands	Irrigated forage production in ASAL	Fodder Value chain in ASAL	Enhanced Honey VC in ASAL	Benefit/Cost analysis of reseeding using ox-furrows and range pitting
Category (i.e. technology, information or innovation)	Information	Information	Technology	Information	Information	Information
Technology description	Impact of Land-use Change on Ecology, Resource Productivity and Adaptive Strategies of Smallholder Agro-Pastoralists determined	-Potential of grasslands in semi -arid areas to sequester carbon was assessed	Grass species known to perform well under irrigation (Cenchrus ciliaris and Sudan grass) planted and irrigated	Status of fodder value chain in selected arid and semi arid areas evaluated	Constraints to harnessing the enormous honey potential in the ASAL determined	Comparison of Benefit/Cost of reseeding with two land preparations methods i.e. range pitting and ox-furrows
Justification (objective of technology)	- Inadequate information on ecological and socio-economic effect of land use change in ASALs - enhanced land degradation due to land use changes and subdivisions	Amount of Carbon sequestered variable in different ecosystems -Land use, season and vegetation impact on carbon storage and	-Growing of forage in pastoral communities under irrigation reduces land and resource use conflict especially during drought - initially dry season grazing areas planted with maize	-ASAL livestock production constraint by feed availability -ASAL characterised by 1. Surplus and scarcity of forage during wet and dry seasons respectively	-Kenya imports honeys despite an existing huge potential - Current production only a fifth of estimated potential(100,000 metric tonnes	The reseeding approaches have been carried out in Southern rangelands but the benefit/cost analysis not done. – Generate information to guide farmers on decision to take up reseeding.

		budget	benefitting only a few households	2.Temporal variability in feed availability	honey, 10,000 tonnes bees wax)	
Region promoted	ASAL of Kenya	Southern ethiopia	Marigat, Tana North, TaitaTaveta, Mbalabala subcounties in Kenya, North West Tanzania	Southern and Northern Rangelands	Makueni and Kajiado counties	Southern rangelands of Kenya (Kajiado, TaitaTaveta, Machakos, Makueni)
Evidence of validation	Msc. Thesis	Msc. thesis	Technical report	- Conference paper - Technical report	Technical reports -Conference publications -Honey sample analysis report	Yes
Users of technology	Range managers, governments, policy makers, NGOs, institutions involved in environmental conservation	Range managers, governments, NGOs, institutions involved in climate change issues, environmental organizations	Agro pastoralists and pastoralists	Agropastoralist and Pastoralists	Agro pastoralists and pastoralists	Reseeding/rehabilitating degraded rangelands
Approaches of dissemination	Feedback meetings and Publications	Feedback meetings and Publications	On-farm Demonstration	-Focus group discussion	On-farm Demonstration -Training workshops -Feedback workshops	Field days, On-farm demonstrations, Flyers, Technical reports, Technical papers Conference
Most effective approach	Publications	Mostly publications based on the users of the	On-farm demonstration	Innovation platforms	Training workshops	On-farm demonstrations

		information				
Critical/essential factors for successful promotion	Linkages with policy makers, advocates of resource conservation in ASAL and pastoral and agro-pastoral communities	Linkages with universities and research organizations i	-Functional fodder value chain	- commercially oriented livestock production in pastoral systems	-Functional Honey Value chain	None
Partners/stakeholder for scaling up	<ul style="list-style-type: none"> - Policy makers - Extension Agents - NGOs - Farmer groups 	Research organizations – eg. ILRI, university of Hohenheim , GrasNet project	MoALF, NGO, CBOs	MoALF CBOs NGOs	MoALF, NGO, CBOs	Ministry of Agriculture livestock department
Current extent of reach	Farmers in study sites only	The semi arid grasslands, different ecosystems involved in carbon sequestration activities	NE	NE	NE	Southern rangelands of Kenya (Kajiado, TaitaTaveta, Machakos, Makueni)
Challenges in dissemination	<ul style="list-style-type: none"> -The notion of individual land ownership -poor management of ranches that fuels calls for subdivisions 	Community involvement – most did not understand the rationale of the project due to education levels	<ul style="list-style-type: none"> -High cost of seed -Inadequate seed - high start up capital -underdeveloped fodder value chain 	Resources	-Lack of a functional honey value chain	Labour intensiveness
Recommendations for addressing challenges	Aggressive involvement of community in all aspects of planning	Aggressive involvement of community in all aspects of	<ul style="list-style-type: none"> -Avail seed at cheaper cost - provide financial services 	Source for resources	-Develop a Honey Value chain	Mechanization

	and implementation of activities	planning and implementation of activities	-Develop ASAL fodder value chain			
Lessons learnt			-Irrigated forage production is profitable - Irrigated forage production cushions livestock during drought	-ASAL fodder value chain is underdeveloped -Development of ASAL Fodder VC has great potential for improved livestock production	-beekeeping has the potential to improve the living standards of the ASAL communities -Bee populations are reducing -Bee forage is on the decline -Land use change has affected bee keeping adversely -log hive are mostly used -High cost of modern hives constrain adoption	The two approaches both break even
Social, environmental and market conditions necessary			-	Product oriented production	-Functional Honey VC -	None
Basic costs	Sampling costs, analysis, travel, researchers and support staff e.t.c	Sampling costs, analysis, travel, researchers and support staff e.t.c	KSh7000 (US\$83) and 14000 (US\$165) using drought or tractor per acre excluding cost of water pump	NE	Apiary establishment	Land, labour, farm implements
Estimated returns	N/A	N/A	US\$ 360 /ha		ND	Benefit/Cost ratio more

						than 1
Gender issues and concerns in development and dissemination	N/A	N/A	The men. Women and youth should all be involved	Need to involve all categories of gender	-Fewer women engage in bee farming due to type of hives used	Men, women, youth can get involved
Gender issues and concerns in adoption and scaling up	N/A	N/A	The men. Women and youth should all be involved	All gender to be considered	-Promote hives that include women	None
Gender related opportunities	N/A	N/A	-Reduces length of time women take in looking for feed for young stock - Reduces time from livestock migration hence family cohesiveness	Efficient Fodder VC will benefit all gender interms of improved food security and livelihoods	-Bee keeping can provide women and youth with sources of income	None
Success stories		Project ongoing Similar work undertaken elsewhere especially in agricultural environments yielding positive results in Africa through payments of carbon credits.	Case of Korio Farm and Biskidera Jabesa group in Tana North, Singale Buradanza Tilt il Farms in Mbalabala, Garissa	NA	-37 bee keepers trained in Makeni county -Honey samples from trained groups indicated improved quality	None
Application guidelines for users	ND	ND	ND	ND	Beekeeping Manual	None
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Partner organization	The University of Nairobi	Haramaya University, Ethiopia, Yabello agricultural research institute	-TALIRI, MABUKI Tanzania - OARI, Yabello , Ethiopia		ICIPE, Kibwezi Women beekeepers Group MoALF	University of Nairobi

Technologies, Information and Innovations in Livestock Production Developed at ARLRI Kiboko Research Centre from 2009-2014

Technology/information /innovation name	Parasite resistance in Young stock in ASAL	Estimation of supply response of livestock products	Improving value of crop residue using browse	Feed Conservation strategies using local structures	The use of animal and farm models as decision support tools in dairy Cattle production
Category (i.e. technology, information or innovation)	Information	Information	Innovation	Information	Information

Technology description	Young stock treated with different anti-helminthics and monitored.	Factors that influence supply of livestock products determined	-Locally available underutilized feed materials used to formulated balanced feed	-Effectiveness of different local feed conservation structures	Effectiveness of digital platforms in making economic decisions in cattle dairy production systems
Justification (objective of technology)	-Studies report development of resistance to all classes of anti-helminthic in the market - Availability of fake products in the market – Inadequate skills to properly diagnose and select the right drug among livestock keepers _ Inadequate information available on helminthes resistance in the ASALs of Kenya	The supply response of livestock producers is a critical component in the study of livestock markets hence; -Analyze the relationships between the supply of livestock products and their influencing factors -Estimate the livestock products supply responses (in terms of signs and absolute magnitudes) and analyze their effect on the supply of livestock products. -Analyze livestock products’ supply determinants.	-Increase feed availability -Reduce feed costs -Improve productivity	-Reduce feed quality losses -Increase feed acceptability -Increase productivity	-Producers lack simple ways of assessing the effects of certain feeding regimes on their lactating cows. Decisions made in the farm have implications on returns in dairy farm operations. Models can be used to assess the economic implication of farm decisions. - Increase use of models to assess economic implication of farm decisions
Region promoted	Kajiado and Makueni Counties	Kajiado	-Tana North - Marigat -Taveta Sub-counties	-Tana North - Marigat -Taveta -Turkana west Sub-counties	- Mbeere sub-county, Embu county
Evidence of validation	Technical report	MA Thesis	-Refereed Journal Publications	-Refereed Journal Publications	-MSc Thesis - Two Refereed journal

			- Phd thesis	- Phd thesis	publications
Users of technology	Agro pastoralists and pastoralists	Research/Universities institution Policy planners Agro pastoralists and pastoralists	Agro-pastoralists and Pastoralists	-Agro-pastoralists -Pastoralists	- Dairy cattle farmers - Farms running different farm operations
Approaches of dissemination	On-farm Demonstration	Training and feedback workshops FGDs	-On farm demonstration	-On farm demonstration	- Training and feedback workshops - Seminars
Most effective approach	On-farm Demonstration	Training and feedback workshops	On farm demonstration	- On farm demonstration	-Seminars
Critical/essential factors for successful promotion	-Availability of right drugs in the mrkt	Estimated model shows that price, climate and national inflation in that order plays an important role in determining the supply of livestock products	-functional Innovation platforms	-functional Innovation platforms	- Routine and authentic farm records in cattle dairies
Partners/stakeholder for scaling up	- MoALF, NGOs	MoALF, KMC, KLMC, NGO, CBOs	- Extension Agents - NGOs - CBOs - Farmer groups	- Extension Agents - NGOs - CBOs - Farmer groups	- MoALF - NGOs - Farmer groups
Current extent of reach	NE	Not estimated	-low level of upscaling	NA	Not estimated
Challenges in dissemination	-Inadequate extension/skilled services -cultural practices	Inadequate information on commercially oriented livestock production approach to respond to supply determinants	-low literacy level - inadequate adaptation of technology	-low literacy levels - inadequate adaptation of technology	-low literacy levels on computer application/skills - inadequate availability of computer hardware
Recommendations for addressing challenges	- Enhance extension services	Extension materials on market	-adapt technology to different areas	-Develop cost effective feed	- Deepening of computer skills and reducing cost of

		incentive/signals		conservation techno	hardware
Lessons learnt	- Helminthes a major challenge in the ASAL -Pastoralists don't seek for professional advice on parasite control - There are substandard drugs in the market	- collective marketing approach to enjoy economies of scale	- Browse harvesting and conservation technologies need improvement -Browse acceptability low	-Structures need not be expensive - Feed conservation not common -changing climate increasing urgency for adoption of feed conservation	-Farmers don't keep records of their farm operations
Social, environmental and market conditions necessary	-Proper regulation of access and dispensing of drugs	Collective approach from all stakeholders	- browse feed material need to be domesticated - Appropriate feed plants management strategies need to be designed and promoted		- Stakeholder involvement
Basic costs	ND	Not Estimated	-Variable based on the materials used	--Variable based on the materials used	- Not Estimated
Estimated returns	ND	Not Estimated	-To be determined		- Not Estimated
Gender issues and concerns in development and dissemination	Target men and the youth	NA	- Women and youth involved in collection of the browse -To target women in dissemination		-The approach is more appealing to the youth
Gender issues and concerns in adoption and scaling up		NA	-		-Cattle dairy is mainly practiced by old men and women
Gender related opportunities	-Training of the youth can provide skilled labour besides providing employment	NA	- Portends development of cottage industry for feed manufacturing for youth	- Quality conserved feed provide a source of income for men, women and youth	- Currently most youths are attracted to computer related skills

Success stories	NA	NA	-		-None
Application guidelines for users	ND	Not Done	ND	ND	- Not Done
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Partner organization					UoN, ILRI

**Technologies, Information and Innovations in Livestock Production Developed at ARLRI Kiboko Research Centre
From 2009-2014**

Technology/information /innovation name	Use of <i>Acacia tortilis</i> pods as a supplementary feed	Utilization of <i>Prosopis juliflora</i> pods to improve livestock productivity	Use of Cotton seedcake as a supplementary feed	Marketing Cattle, sheep and Goats	Performance of Sahiwal and their crosses compared with Small East African Zebu (SEAZ)
Category (i.e. technology, information or innovation)	Technology	Innovation	Technology	Information	Information
Technology description	- <i>Acacia tortilis</i> pods are mixed with dried grass hay, normally low in protein to make a wholesome feed ration	- <i>Prosopis juliflora</i> pods milled and flour used to formulate feed ration based on type of livestock and production objective	Cotton seed cake mixed with low quality grass hay to increase growth and yield	Market requirements for cattle and shoats determined	Community perceptions on performance of Sahiwal, their crosses and SEAZ assessed
Justification (objective of technology)	-the pods are cheap and locally available -low milk yield and slow growth rates during drought -Grass hay low in protein	- <i>Prosopis Juliflora</i> a menace - <i>P. juliflora</i> is high in protein - P.juliflora removal and milling reduces spread of the weed - use of P.juliflora as livestock feed	-Cotton seedcake is available as a by-product in cotton ginneries -low milk yield and slow growth rates	-Mismatch between supply and demand of beef, sheep and goat meat due to inadequate production and market planning leading to 'market failure'. - Address the causes of market failure - Develop an efficient red meat value chain	-Small East African Zebu (SEAZ) a hardy breed - SEAZ been replaced by Sahiwal and their crosses. - Sahiwal vulnerable to both droughts and diseases. -Info on performance of sahiwal and their crosses in semi-arid areas characterised by feed stress scanty
Region promoted	Southeastern (Makueni,	Baringo, Tana North,	South-eastern	Makueni and Kajiado	Not yet promoted

	Taita- Taveta), and Northern Kenya rangelands (Baringo).	Taveta subcounties in Kenya,	Kenya rangelands- Makueni, Taita- Taveta.	counties	
Evidence of validation	-Msc. Thesis - Refereed journal paper	-Technical reports	-Msc. Thesis - Refereed journal paper	Technical report	Technical report
Users of technology	Agro-pastoralists and Pastoralists	Agro-pastoralists and Pastoralists	Agro-pastoralists and Pastoralists	Policy planners Agro pastoralists and pastoralists	Pastoralists
Approaches of dissemination	- on farm demonstration - posters -conferences -Field days	- on farm demonstration - posters -conferences -Field days	- on farm demonstration - posters -conferences -Field days	Training and feedback workshops FGDs	Field days, agricultural shows, Farmer group sensitization, leaf lets, brochures.
Most effective approach	-Field days	-Field days	-Field days	Training and feedback workshops	Farmer field day
Critical/essential factors for successful promotion	-availability of <i>Acacia tortilis</i> pods	-Availability of <i>P.Juliflora</i> or any other high and cheap protein source	-Availability of <i>Acacia tortilis</i> pods	commercially oriented livestock production in pastoral and agro-pastoral systems	Need for on-farm validation, production of brochures
Partners/stakeholder for scaling up	- Extension Agents - NGOs - feed manufacturers	- Extension Agents - NGOs - feed manufacturers -	- Extension Agents - NGOs - feed manufacturers	MoALF, KMC, KLMC	Ministry of Agriculture, Livestock and Fisheries development extension staff, contact farmers
Current extent of reach	NE	NE	NE	Not estimated	NE
Challenges in dissemination	-inadequate skills in ration formulation -labour intensive (harvest and storage) -weak extension service	- inadequate skills in ration formulation -labour intensive (harvest and storage) -labour intensive (harvest and storage) - Attitude towards <i>P.juliflora</i> -requires substantial	-inadequate skills in ration formulation -	Inadequate extension information on export/local market requirements for cattle and shoats	Facilitation to; conduct adoption study, produce brochures

		starting capital			
Recommendations for addressing challenges	Capacity building - backstopping/ facilitation of contact farmers as demonstration units -access to credit facility to hire labour	- Capacity build pastoral communities -develop an efficient pod harvesting technique -Sensitization on use of <i>P. juliflora</i>	Capacity building - backstopping/ facilitation of contact farmers as demonstration units -access to credit facility to hire labour	Extension materials on market requirements	Source funds to facilitate adoption studies, on-farm demonstrations
Lessons learnt	-bulky pods requiring large storage space - crush the pods to reduce substitution of the basal diet, - grinding to release nutrients from the seed -there is need to bulk because the pods are available seasonally	- <i>P.juliflora</i> is a resource if well managed	-cost of cotton seedcake is high -	-Need to package and disseminate technologies for quality beef, and sheep and goats production - Need to share information on different livestock market quality requirement standards	Lack of knowledge by the farmers on the use of the supplements especially cotton seed cake
Social, environmental and market conditions necessary	Need to have policy to conserve and plant more <i>Acacia tortilis</i> trees -Need to identify a market for the pods esp. feed companies	- Attitude change - Availability of efficient <i>P.juliflora</i> management technology	policy to improve cotton production locally --improve cotton producer prices -subsidize cotton production inputs	Stakeholder involvement	Need for initial capital for the farmers to purchase the supplements
Basic costs	Ksh300/bag of 30kg	NE	Ksh. 650/bag of 50kg	Not Estimated	Cost of the supplement. Labour cost of feeding
Estimated returns	Ksh 40/kg/day	NE	Ksh 80/kg/day	Not Estimated	NE
Gender issues and concerns in development and dissemination	-Women and youth involved in collection of the pods -To target women in dissemination	- Target women and youth	- To target women in dissemination	The men, women and youth should all be involved	Technology development has to involve men in pastoralist communities because they are the ones

					who have overall control of the cattle.
Gender issues and concerns in adoption and scaling up	-need to involve men especially in pastoralist communities	-Milling of pods done by men	-need to involve men especially in pastoralist communities	The men. Women and youth should all be involved	The technology is targeting men in pastoralist communities because they are the ones who have overall control of the cattle
Gender related opportunities	more milk for women and children - animals attain market weight faster thus benefitting the men	- Development of cottage industries by communities if technology is refined esp. the milling of <i>P.juliflora</i>	-more milk for women and children - animals attain market weight faster thus benefitting the men	Functioning marketing will benefit all gender	better nutrition among children, elderly persons and vulnerable groups from increased income accruing from improved liveweight gains
Success stories		- <i>P. juliflora</i> flour been incorporated in commercial feeds e.g Sigma Feeds	-	NA	NA
Application guidelines for users	ND	ND	ND	Not Done	ND
Contacts	The Centre Director, ARLRI , Kiboko RC P.O. Box 12-90138 Makindu Kenya arlri@karlo.com	The Centre Director, ARLRI, Kiboko RC , P.O. Box 12-90138 Makindu Kenya arlri@karlo.com	The Centre Director, ARLRI , Kiboko RC P.O. Box 12-90138 Makindu Kenya arlri@karlo.com	The Centre Director, ARLRI , Kiboko RC, P.O. Box 12-90138 Makindu Kenya arlri@karlo.com	The Centre Director, ARLRI, Kiboko RC P.O. Box 12-90138 Makindu Kenya arlri@karlo.com
Lead organization and scientist	ARLRI , Kiboko RC Mr.Bii, J.C Prof S.A Abdukrazak. Dr.Mukisira E.A	ARLRI, Kiboko RC Dr.Ndathi A.J.N	ARLRI, Kiboko RC Mr.Bii, J.C Prof S.A Abdukrazak. Dr. Mukisira E.A	ARLRI, Kiboko RC Manyeki JK	ARLRI, Kiboko RC Mr.Bii J.C,
Partner organization		MoALF	Egerton University,		

			Kenya.		
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Please note: NA- Not available NE- Not estimated ND- Not done