



INVENTORY OF CLIMATE SMART AGRICULTURE CASSAVA TECHNOLOGIES, INNOVATIONS & MANAGEMENT PRACTICES

Compiled by

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1.0 Definition of terms and summary tables of cassava Technologies, Innovations and Management Practices (TIMPS)

1.1 Definition of terms

Technology: This is defined as an output of a research process which is beneficial to the target clientele (mainly farmers, pastoralists, agro-pastoralists and fisher folk for KCSAP's case), can be commercialized and can be patented under intellectual property rights (IPR) arrangements. It consists of research outputs such as tools, equipment, genetic materials, breeds, farming and herding practices, gathering practices, laboratory techniques, models etc.

Management practice: This is defined as recommendation(s) on practice(s) that is/are considered necessary for a technology to achieve its optimum output. These include, for instance, different agronomic and practices (seeding rates, fertilizer application rates, spatial arrangements, planting period, land preparation, watering regimes, etc.), protection methods, for crops; and feed rations, management systems, disease control methods, etc. for animal breeds. This is therefore important information which is generated through research to accompany the parent technology before it is finally released to users and the technology would be incomplete without this information.

Innovation: This is defined as a modification of an existing technology for an entirely different use from the original intended use. (e.g. fireless cooker modified to be used as a hatchery)

1.2 Summary of Inventory of TIMPs in the Cassava Value Chain

The inventory process resulted in a total of 13 TIMPs including 7 technologies, 1 innovation and 2 management practices, distributed among the 5 sub-themes, as indicated in Table 1

Table 1:

Commodity/VC	Sub-Theme	Technologies	Innovations	Management Practices
Cassava	Improved varieties	13	0	0
Cassava	Agronomic practices	8	0	1
Cassava	Seed technologies	1	0	0
Cassava	Management Pests and diseases	7	1	1
Cassava	Value addition	3	0	0
Overall Total		32	1	2

1.3 Summary of Status of TIMPs in Cassava Value Chain

The inventory process resulted in a total of 12 TIMPs that are ready for up-scaling, 0 TIMPs that require validation and 0 TIMPs that require further research in the sub-themes, as indicated in Table 2.

Table 2. Number of TIMPs ready for upscaling, require validation or further research

Commodity/VC	Sub-Theme	Ready for upscaling	Require validation	Further Research
Cassava	Improved varieties	13	6	3
Cassava	Agronomic practices	8	3	1
Cassava	Seed technologies	1	2	1
Cassava	Pests and diseases	7	3	0
Cassava	Value addition	3	3	3
Overall Total		32		

Table 3: Inventory of Cassava TIMPs by Category and Status

TIMPs Sub-Theme	TIMPs Title	TIMPs Category	Status
2.1 Improved varieties	2.1.1 Cassava variety MM95/0183	Technology	Ready for upscaling
	2.1.2 Cassava variety Katsuhanzala (990132)	Technology	Ready for upscaling
	2.1.3 Cassava variety KME-3	Technology	Ready for upscaling
	2.1.4 Cassava variety Katune (990005)	Technology	Ready for upscaling
	2.1.5 Cassava variety KME-2	Technology	Ready for upscaling
	2.1.6 Cassava variety Migyera	Technology	Ready for upscaling
	2.1.7 Cassava variety Shibe	Technology	Ready for upscaling
	2.1.8 Cassava variety Karembo	Technology	Ready for upscaling
	2.1.9 Cassava variety Tajirika	Technology	Ready for upscaling
	2.1.10 Cassava variety MM98/3567	Technology	Ready for upscaling
	2.1.11 Cassava variety MM96/4271	Technology	Ready for upscaling
	2.1.12 Cassava variety MM98/0291	Technology	Ready for upscaling

	2.1.13 Cassava variety MM96/7151	Technology	Ready for upscaling
	2.1.14 Developing early bulking varieties	Technology	Research
	2.1.15 Pyramiding Brown streak tolerance, Mosaic virus and high yield	Technology	Research
	2.1.16 Developing varieties for (Variety, introduction, profiling and breeding for specific market niche)	Technology	Research
2.2 Agronomic practices	2.2.1 Ridging to break hard pan	Management practice	Ready for upscaling
	2.2.2 Fertilizer use	Management practice	Ready for up-scaling
	2.2.3 Intercropping	Management practice	Validation and up scaling
	2.2.4 Liming	Management practice	Validation and up scaling
	2.2.5 Irrigation	Management practice	Up-Scaling
	2.2.6 Conservation Agriculture	Management practice	Validation and up scaling
	2.2.7 Planting	Management practice	Validation and up scaling
	2.2.8 Weed management	Management practice	Up-Scaling
	2.2.9 Harvesting Technics	Management practice	Validation and up scaling
	2.2.10 Storage	Management practice	Validation and up scaling
2.3 Seed Production	2.3.1 Community based seed production system(Rapid Seed Multiplication techniques - Mini-stem, Seed cleaning, Seed management agronomy Seed certification Seed harvesting, packaging and storage)	Management practices	Validation and up-scaling
2.4 Management of pests and diseases	2.4.1 Integrated management of cassava mosaic diseases (CMD) caused by <i>Begomovirus</i>	Management Practice	Ready for upscaling
	2.4.2 Integrated management of cassava brown streak disease (CBSD) caused by <i>Ipomovirus</i>	Management Practice	Ready for upscaling
	2.4.3 Integrated management of cassava bacterial blight (CBB) caused by <i>Xanthomonas Manihot</i> bacteria	Management Practice	Ready for upscaling
	2.4.4 Integrated management of cassava anthracnose caused by fungus	Management Practice	Ready for upscaling

	2.4.5 Integrated management of cassava green mite (CGM) caused <i>Mononychellus tanajoa</i> (Bondar)	Management Practice	Ready for upscaling
	2.4.6 Integrated management of cassava Mealy Bug, <i>Phenacoccus manihoti</i> Matile-Feraro	Management Practice	Ready for upscaling
	2.4.7 Integrated management of whitefly, <i>Bemisia tabaci</i>	Management Practice	Ready for upscaling
	2.4.8 Integrated management of cassava red spider mite, <i>Tetranychus urticae</i>	Management Practice	Ready for upscaling
	2.4.9 Integrated management of cassava white scales, <i>Aonidomytilus albus</i>	Management Practice	Ready for upscaling
	2.4.10 Integrated management of cassava mammalian pests e.g. Moles	Management Practice	Ready for upscaling
	2.4.11 Surveillance, development and promotion of IPM on emerging pest and disease	innovation	Research
2.5 Value addition	Cassava food / utilization products		
	(i) Cassava processing techniques		
	2.5.4 Cyanide poisoning reduction techniques	Innovation	Ready for up-scaling
	2.5.5 Cassava cleaning, Cassava peeler, chipper, graters, driers and miller,		
	2.5.6 Research cassava flour blending with other cereal flours for nutrition and value addition	Innovation	Research
	(ii) Development, consumer evaluation, promotion and dissemination of cassava processed products		
	2.5.1 Cassava/wheat Chapati	Innovation	Ready for up-scaling
	2.5.2 Cassava/maize Ugali	Innovation	Ready for up-scaling
	2.5.3 Cassava/Millet Ugali	Innovation	Ready for up-scaling
	2.5.5 Cassava/pigeon pea porridge	Innovation	Ready for up-scaling
	2.5.6 Cassava post-harvest Mechanization	Innovation	Validation and Upscaling
	2.5.7 Cassava products: Cassava boards, Glue, Starch, Sugar, Ethanol and animal feed Animal feed	Innovation	Validation and Upscaling
2.6 Marketing	2.6.1 Identification of existing marketing strategies for cassava produce and products	GAP	Validation and Upscaling
	2.6.2 Scoping and profiling existing cassava markets commercial villages and innovation platforms for scaling-up	GAP	Validation and Upscaling

	2.6.3 Prioritization of viable cassava products, Consumer tastes and preferences – consumer analysis	GAP	Validation and Upscaling
	2.6.4 Business plans, Registration, branding and advertising	GAP	Validation and Upscaling

2.0 Detailed Cassava Value chain

2.1 Improved varieties

2.1.1 TIMP Name	Cassava variety MM95/0183
Category	<ul style="list-style-type: none"> Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Low productivity due to crop damage by cassava brown streak disease (CBSD) and inadequate high yielding varieties.
What is it	<p>This is a mid-maturing, High/medium yielding cassava variety that is sweet tasting (low cyanide content). Its characteristic features include tolerance to CBSD and 26% dry matter.</p> <p>Optimal environmental conditions: Rainfall 800-1200 annually, altitude range of 800-1500 m.a.s.l. and soils well-drained sandy loam.</p>
Justification	Improved cassava yields are limited by lack of high yielding varieties that are also pest and disease tolerant. Farmers are cultivating low yielding cassava varieties that are late maturing and susceptible to pests and diseases hence there is need to improve and avail to them improved varieties to counter these challenges.
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> Farmers, processors, extension providers, consumers, researchers and seed producers
Approaches to be used in dissemination	<ul style="list-style-type: none"> Farmers field days, demonstration plots, on-farm trials and agricultural shows
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> Preferred traits by farmers, consumers and market niches Selection and use of most effective promotion method Involve all cassava stakeholders in the promotion chain

Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • KALRO-Avail breeder's seed and technical backstopping • Universities-Technical backstopping and tissue culture services • National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services • Kenya Plant Health Inspectorate Services (KEPHIS)-Seed inspection • CBOs, NGO's- Seed multiplication and technology dissemination • Processors: Create demand for variety • Farmers: Test/validate and produce • CGIARS e.g IITA: Donors: Funding and technical backstopping
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> • Counties in Busia, Bungoma, Kakamega, Vihiga, Siaya, Homabay, Kisumu counties
Counties where TIMP will be upscaled /Validated	<ul style="list-style-type: none"> • To be upscaled in Busia and Kisumu and validated in Lamu county
Challenges in dissemination	<ul style="list-style-type: none"> • Seed unavailability • Livestock and wildlife destruction of the crop in the field • Limited extension providers • Poor perception towards new cassava varieties
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Establish working seed systems • Involve local administration to ensure harmony between livestock and cassava farmers • Support improved extension services • Campaign for attitude change
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Successful variety promotion requires availability of ready and consistent market for anticipated increased production
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> • Farmers' willingness • Favorable weather conditions • Availability of market • Favorable policies to support seed/production, marketing and value addition
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	<ul style="list-style-type: none"> • Approximate KES 46,850 per acre
Estimated returns	<ul style="list-style-type: none"> • 50 t/acre @ 5 per Kg farm gate= 203,150.00

Gender issues and concerns in development, dissemination adoption and scaling up	•
Gender issues and concerns in	•
Gender related opportunities	Improved productivity will encourage commercialization thus attract youth and men in cassava industry
VMG issues and concerns in development, dissemination, adoption and scaling up	<ul style="list-style-type: none"> • Due to prejudices associated with their social status, VMGs are excluded from access to and benefits from improved technologies. Thus, affirmative action is required to promote the crop for the VMGs including value addition aspects. • The crop is important for food and nutrition security; therefore, there is need to adopt affirmative action targeting the VMGs for dissemination, adoption and consumption. •
VMG issues and concerns in	• None
VMG related opportunities	Tolerance to disease will reduce costs of disease management and crop loss thus accruing benefits to the whole household, to the benefit of VMGs in terms of food security and incomes.
E: Case studies/profiles of success stories	
Success stories from previous similar projects	<ul style="list-style-type: none"> • This variety is produced Tangakona cassava commercial villages in Busia County, and is a significant source of income to the farmers
Application guidelines for users	
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	<ul style="list-style-type: none"> • Ready for up-scaling in Busia and Kisumu Counties • Requires validation in Lamu County
G: Contacts	H. Obiero C/O Centre Director KALRO Kakamega Box 169 - 50100 Tel 05631753 or 05630031. Email: kalrokakamega@kalro.org
Lead organization and scientists	KALRO Kivuva B. M., Munga T.L and Woyengo V.W
Partner organizations	<ul style="list-style-type: none"> • KALRO-Avail breeder's seed and technical backstopping • Universities-Technical backstopping and tissue culture services • National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services

	<ul style="list-style-type: none"> • Kenya Plant Health Inspectorate Services (KEPHIS)- Seed certification • CBOs, NGO's- Seed multiplication and technology dissemination • Processors: Create demand for variety • Test/validate and produce • CGIARS e.g IITA- Funding and technical backstopping
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2.1.2 TIMP Name	Cassava variety Katsuhanzala (990132)
Category	<ul style="list-style-type: none"> • Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Improved cassava yield is limited by lack of high yielding varieties that are pest and disease tolerant. This variety is high yielding and tolerant to CBSD and therefore would improve the yield if cultivated.
What is it	Matures in 8-10 Month, its root flesh colour is cream with dry matter of 29%; used for home consumption or industrial purposes; Wide adaptation from the coffee zone to the coastal region; yield 36.7t/ha. Resistance to stress, High yielding, high dry matter, low in cyanogenic potential (HCN) and early maturing. Rainfall 500-1000 annually, altitude range of 200-1500 m.a.s.l. and soils well-drained sandy loam.
Justification	Farmers cultivating low yielding cassava varieties that are late maturing and susceptible to pests and diseases hence there is need to improve and avail to them improved varieties to counter these challenges
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> • Farmers, processors, extension providers, consumers, researchers and seed producers
Approaches to be used in dissemination	<ul style="list-style-type: none"> • Farmers field days, demonstration plots, on-farm trials and agricultural shows
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Preferred traits by farmers, consumers and market niches • Promotion methods used • Involve all cassava stakeholders in the promotion chain
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • KALRO-Avail breeder's seed and technical backstopping • Universities-Technical backstopping and tissue culture services • National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services • Kenya Plant Health Inspectorate Services (KEPHIS)-Seed inspection • CBOs, NGO's- Seed multiplication and technology dissemination • Processors: Create demand for variety • Farmers: Test/validate and produce • CGIARS e.g IITA: Donors: Funding and technical backstopping
C: Current situation and future scaling up	

Counties where already promoted, if any	<ul style="list-style-type: none"> Counties in Busia, Bungoma, Kakamega, Vihiga, Siaya, Homabay, Kisumu, Machakos Makueni, Kitui, Tharaka, Taita taveta counties
Counties where TIMP will be upscaled / Validated	<ul style="list-style-type: none"> To be upscaled in Busia and Kisumu and validated in Lamu county
Challenges in dissemination	<ul style="list-style-type: none"> Seed unavailability Livestock destruction Limited extension providers Poor perception towards new cassava varieties
Suggestions for addressing the challenges	<ul style="list-style-type: none"> Establish working seed system Use local administration to ensure harmony between livestock and cassava farmers Support improved extension services Campaign for attitude change
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> Successful variety promotion requires availability of ready and consistent market for anticipated increased production
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> Farmers' willingness Favorable weather conditions Availability of market Favorable policies to support seed/production, marketing and value addition
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	<ul style="list-style-type: none"> Approximate KES 46,850 per acre
Estimated returns	<ul style="list-style-type: none"> 36.7 t/acre @ 5 per Kg farm gate= 136,650
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> Involve men and women in testing of varieties to ensure their preferred quality traits and cropping systems are selected
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> Target both men and women in scaling up to ensure varieties promoted are adopted
Gender related opportunities	High yields will encourage commercialization thus attract youth in cassava industry
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> None
VMG related opportunities	<ul style="list-style-type: none"> None
E: Case studies/profiles of success stories	

Success stories from previous similar projects	<ul style="list-style-type: none"> Establishment of cassava commercial villages in Makueni, Mbuvo, and Busia County, Tangakona Improved income generation from adoption of Tajirika variety in Kilifi County
Application guidelines for users	<ul style="list-style-type: none"> Good agricultural practices
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	<ul style="list-style-type: none"> Ready for up-scaling in Lamu, Busia and Kisumu Counties
G: Contacts	Joseph W. Kamau C/O Centre Director KALRO Katumani Box 169 - 50100 Tel 05631753 or 05630031. Email: kalrokakamega@kalro.org
Lead organization and scientists	KALRO Kivuva B. M., Munga T.L and Woyengo V.W
Partner organizations	<ul style="list-style-type: none"> KALRO-Avail breeder's seed and technical backstopping Universities-Technical backstopping and tissue culture services National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services Kenya Plant Health Inspectorate Services (KEPHIS)-Seed certification CBOs, NGO's- Seed multiplication and technology dissemination Processors: Create demand for variety Test/validate and produce CGIARS e.g IITA- Funding and technical backstopping

2.1.3 TIMP Name	Cassava variety KME-3
Category	<ul style="list-style-type: none"> Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Improved cassava yield is limited by lack of high yielding varieties that are pest and disease tolerant. This variety is high yielding and tolerant to CBSD and therefore would improve the yield if cultivated.
What is it	The variety is resistant to cassava mosaic disease, early maturing, has Low CNP and sweet, Poundable. Its Root pulp colour is cream with dry matter of 29% .It grows in warm, semi-arid areas, 200-2000 m.a.s.l with rainfall range of 500-1000 mm per year, and matures between 8-10 .It yields 40 t/ha and is tolerant to drought

Justification	Farmers cultivating low yielding cassava varieties that are late maturing and susceptible to pests and diseases hence there is need to improve and avail to them improved varieties to counter these challenges
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> Farmers, processors, extension providers, consumers, researchers and seed producers
Approaches to be used in dissemination	<ul style="list-style-type: none"> Farmers field days, demonstration plots, on-farm trials and agricultural shows
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> Preferred traits by farmers, consumers and market niches Promotion methods used Involve all cassava stakeholders in the promotion chain
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> KALRO-Avail breeder's seed and technical backstopping Universities-Technical backstopping and tissue culture services National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services Kenya Plant Health Inspectorate Services (KEPHIS)-Seed inspection CBOs, NGO's- Seed multiplication and technology dissemination Processors: Create demand for variety Farmers: Test/validate and produce CGIARS e.g IITA: Donors: Funding and technical backstopping
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> Counties in Busia, Bungoma, Kakamega, Vihiga, Siaya, Homabay, Kisumu, Machakos Makueni, Kitui, Tharaka, Taita taveta counties
Counties where TIMP will be upscaled / Validated	<ul style="list-style-type: none"> To be validated in Busia, Kisumu and Lamu counties
Challenges in dissemination	<ul style="list-style-type: none"> Seed unavailability Livestock destruction Limited extension providers Poor perception towards new cassava varieties
Suggestions for addressing the challenges	<ul style="list-style-type: none"> Establish working seed system Use local administration to ensure harmony between livestock and cassava farmers Support improved extension services Campaign for attitude change

Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Successful variety promotion requires availability of ready and consistent market for anticipated increased production
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> • Farmers' willingness • Favorable weather conditions • Availability of market • Favorable policies to support seed/production, marketing and value addition
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	<ul style="list-style-type: none"> • Approximate KES 46,850 per acre
Estimated returns	<ul style="list-style-type: none"> • 40 t/acre @ 5 per Kg farm gate= 153,150
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> • Involve men and women in testing of varieties to ensure their preferred quality traits and cropping systems are selected
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • Target both men and women in scaling up to ensure varieties promoted are adopted
Gender related opportunities	High yields will encourage commercialization thus attract youth in cassava industry
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> • None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • None
VMG related opportunities	<ul style="list-style-type: none"> • None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	<ul style="list-style-type: none"> • Establishment of cassava commercial villages in Makueni, Mbuvo, and Busia County, Tangakona • Improved income generation from adoption of Tajirika variety in Kilifi County
Application guidelines for users	
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	<ul style="list-style-type: none"> • Require validation in Lamu, Busia and Kisumu Counties
G: Contacts	Joseph W. Kamau C/O Centre Director KALRO - Katumani, P.O. Box 340-90100 Email kalro.katumani. kalro.org Telephone. 0710906600

Lead organization and scientists	KALRO Kivuva B. M., Munga T.L and Woyengo V.W
Partner organizations	<ul style="list-style-type: none"> • KALRO-Avail breeder's seed and technical backstopping • Universities-Technical backstopping and tissue culture services • National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services • Kenya Plant Health Inspectorate Services (KEPHIS)-Seed certification • CBOs, NGO's- Seed multiplication and technology dissemination • Processors: Create demand for variety • Test/validate and produce • CGIARS e.g IITA- Fundingand technical backstopping

2.1.4 TIMP Name	Cassava variety Katune (990005)
Category	<ul style="list-style-type: none"> • Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Improved cassava yield is limited by lack of high yielding varieties that are pest and disease tolerant. This variety is high yielding and tolerant to CBSD and therefore would improve the yield if cultivated.
What is it	Matures in 8-10 months; Flesh colour is cream;Dry-matter 30%; Wide adaptation from the coffee zone to the coastal region; Yields 37.1 t/ha; and Resistant to cassava mosaic disease. Rainfall 500-1000 annually, altitude range of 200-1500 m.a.s.l. and soils well-drained sandy loam.
Justification	Farmers cultivating low yielding cassava varieties that are late maturing and susceptible to pests and diseases hence there is need to improve and avail to them improved varieties to counter these challenges
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> • Farmers, processors, extension providers, consumers, researchers and seed producers
Approaches to be used in dissemination	<ul style="list-style-type: none"> • Farmers field days, demonstration plots, on-farm trials and agricultural shows
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Preferred traits by farmers, consumers and market niches • Promotion methods used • Involve all cassava stakeholders in the promotion chain

Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • KALRO-Avail breeder's seed and technical backstopping • Universities-Technical backstopping and tissue culture services • National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services • Kenya Plant Health Inspectorate Services (KEPHIS)-Seed inspection • CBOs, NGO's- Seed multiplication and technology dissemination • Processors: Create demand for variety • Farmers: Test/validate and produce • CGIARS e.g IITA: Donors: Funding and technical backstopping
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> • Counties in Busia, Bungoma, Kakamega, Vihiga, Siaya, Homabay, Kisumu, Machakos Makueni, Kitui, Tharaka, Taita taveta counties
Counties where TIMP will be upscaled / Validated	<ul style="list-style-type: none"> • To be upscaled in Busia, Kisumu and Lamu Counties
Challenges in dissemination	<ul style="list-style-type: none"> • Seed unavailability • Livestock destruction • Limited extension providers • Poor perception towards new cassava varieties
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Establish working seed system • Use local administration to ensure harmony between livestock and cassava farmers • Support improved extension services • Campaign for attitude change
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Successful variety promotion requires availability of ready and consistent market for anticipated increased production
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> • Farmers' willingness • Favorable weather conditions • Availability of market • Favorable policies to support seed/production, marketing and value addition
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	<ul style="list-style-type: none"> • Approximate KES 46,850 per acre
Estimated returns	<ul style="list-style-type: none"> • 37.1 t/acre @ 5 per Kg farm gate= 138,650

Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> Involve men and women in testing of varieties to ensure their preferred quality traits and cropping systems are selected
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> Target both men and women in scaling up to ensure varieties promoted are adopted
Gender related opportunities	High yields will encourage commercialization thus attract youth in cassava industry
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> None
VMG related opportunities	<ul style="list-style-type: none"> None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	<ul style="list-style-type: none"> Establishment of cassava commercial villages in Makueni, Mbuvo, and Busia County, Tangakona Improved income generation from adoption of Tajirika variety in Kilifi County
Application guidelines for users	
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	<ul style="list-style-type: none"> Require validation in Lamu, Busia and Kisumu Counties
G: Contacts	Joseph W. Kamau C/O Centre Director KALRO - Katumani, P.O. Box 340-90100 Email kalro.katumani. kalro.org
Lead organization and scientists	KALRO Kivuva B. M., Munga T.L and Woyengo V.W
Partner organizations	<ul style="list-style-type: none"> KALRO-Avail breeder's seed and technical backstopping Universities-Technical backstopping and tissue culture services National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services Kenya Plant Health Inspectorate Services (KEPHIS)-Seed certification CBOs, NGO's- Seed multiplication and technology dissemination Processors: Create demand for variety Farmers: Test/validate and produce CGIARS e.g IITA- Funding and technical backstopping Donors: Funding

2.1.5 TIMP Name	Cassava variety KME-2
Category	<ul style="list-style-type: none"> Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Improved cassava yield is limited by lack of high yielding varieties that are pest and disease tolerant. This variety is high yielding and tolerant to CBSD and therefore would improve the yield if cultivated.
What is it	The variety is resistant to cassava mosaic disease, is early maturing, Low CNP/Sweet, Poundable, Yields 45 t/ha , matures between 8-10 months and performs well in warm, semi-arid areas between 200 – 2000 m.a.s.l. with rainfall of 500-1000mm per year.
Justification	Farmers cultivating low yielding cassava varieties that are late maturing and susceptible to pests and diseases hence there is need to improve and avail to them improved varieties to counter these challenges
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> Farmers, processors, extension providers, consumers, researchers and seed producers
Approaches to be used in dissemination	<ul style="list-style-type: none"> Farmers field days, demonstration plots, on-farm trials and agricultural shows
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> Preferred traits by farmers, consumers and market niches Promotion methods used Involve all cassava stakeholders in the promotion chain
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> KALRO-Avail breeder's seed and technical backstopping Universities-Technical backstopping and tissue culture services National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services Kenya Plant Health Inspectorate Services (KEPHIS)-Seed inspection CBOs, NGO's- Seed multiplication and technology dissemination Processors: Create demand for variety Farmers: Test/validate and produce CGIARS e.g IITA: Donors: Funding and technical backstopping
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> In eastern and Coastal Kenya

Counties where TIMP will be upscaled / Validated	<ul style="list-style-type: none"> To be upscaled in Lamu and validated Busia and Kisumu Counties
Challenges in dissemination	<ul style="list-style-type: none"> Seed availability Livestock destruction Limited extension providers Poor perception towards new cassava varieties
Suggestions for addressing the challenges	<ul style="list-style-type: none"> Establish working seed system Use local administration to ensure harmony between livestock and cassava farmers Support improved extension services Campaign for attitude change
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> Successful variety promotion requires availability of ready and consistent market for anticipated increased production
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> Farmers' willingness Favorable weather conditions Availability of market Favorable policies to support seed/production, marketing and value addition
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	<ul style="list-style-type: none"> Approximate KES 46,850 per acre
Estimated returns	<ul style="list-style-type: none"> 40. t/acre @ 5 per Kg farm gate= 153,150
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> Involve men and women in testing of varieties to ensure their preferred quality traits and cropping systems are selected
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> Target both men and women in scaling up to ensure varieties promoted are adopted
Gender related opportunities	High yields will encourage commercialization thus attract youth in cassava industry
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> None
VMG related opportunities	<ul style="list-style-type: none"> None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	<ul style="list-style-type: none"> Establishment of cassava commercial villages in Makueni, Mbuvo, and Busia County, Tangakona Improved income generation from adoption of Tajirika variety in Kilifi County

Application guidelines for users	<ul style="list-style-type: none"> • Good agricultural practices
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	<ul style="list-style-type: none"> • Require validation in Busia and Kisumu and scaling up in Lamu Counties
G: Contacts	<p>Joseph W. Kamau C/O Centre Director KALRO - Katumani, P.O. Box 340-90100 Email kalro.katamani. kalro.org Telephone. 0710906600</p>
Lead organization and scientists	<p>KALRO Kivuva B. M., Munga T.L and Woyengo V.W</p>
Partner organizations	<ul style="list-style-type: none"> • KALRO-Avail breeder's seed and technical backstopping • Universities-Technical backstopping and tissue culture services • National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services • Kenya Plant Health Inspectorate Services (KEPHIS)-Seed certification • CBOs, NGO's- Seed multiplication and technology dissemination • Processors: Create demand for variety • Farmers: Test/validate and produce • CGIARS e.g IITA- Funding and technical backstopping • Donors: Funding

2.1.6 TIMP Name	Cassava variety Mygera
Category	<ul style="list-style-type: none"> • Technology
A: Description of the technology, innovation or management practice	
Problem addressed	<ul style="list-style-type: none"> • Lack of high yielding varieties • Lack of pest and disease tolerant varieties • Lack of appropriate industrial varieties • Lack of drought tolerant varieties
What is it	<ul style="list-style-type: none"> • Matures in 10 to 15 months, • Yields 20 t/ha, • Sweet/ low cyanide, • Production altitude 800-1750 masl. • Dry matter 24 %, rainfall ranges 500-1200mm per year
Justification	<ul style="list-style-type: none"> • Farmers cultivating low yielding cassava varieties that are late maturing and susceptible to pests and diseases hence there is need to improve and avail to them improved varieties to counter these challenges

B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> Farmers, processors, extension providers, consumers, researchers and seed producers
Approaches to be used in dissemination	<ul style="list-style-type: none"> Farmers field days, demonstration plots, on-farm trials and agricultural shows
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> Preferred traits by farmers, consumers and market niches Promotion methods used Involve all cassava stakeholders in the promotion chain
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> KALRO-Avail breeder's seed and technical backstopping Universities-Technical backstopping and tissue culture services National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services Kenya Plant Health Inspectorate Services (KEPHIS)-Seed inspection CBOs, NGO's- Seed multiplication and technology dissemination Processors: Create demand for variety Farmers: Test/validate and produce CGIARS e.g IITA: Donors: Funding and technical backstopping
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> Counties in Busia, Bungoma, Kakamega, Vihiga, Siaya, Homabay, Kisumu, Machakos Makueni, Kitui, Tharaka, Taita taveta counties
Counties where TIMP will be upscaled / Validated	<ul style="list-style-type: none"> To be upscaled in Busia and Kisumu and validated in Lamu county
Challenges in dissemination	<ul style="list-style-type: none"> Seed un availability Livestock destruction Limited extension providers Poor perception towards new cassava varieties
Suggestions for addressing the challenges	<ul style="list-style-type: none"> Establish working seed system Use local administration to ensure harmony between livestock and cassava farmers Support improved extension services Campaign for attitude change
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> Successful variety promotion requires availability of ready and consistent market for anticipated increased production
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> Farmers' willingness Favorable weather conditions Availability of market

	<ul style="list-style-type: none"> Favorable policies to support seed/production, marketing and value addition
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	<ul style="list-style-type: none"> Approximate KES 46,850 per acre
Estimated returns	<ul style="list-style-type: none"> 20 t/acre @ 5 per Kg farm gate= 53,150
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> Involve men and women in testing of varieties to ensure their preferred quality traits and cropping systems are selected
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> Target both men and women in scaling up to ensure varieties promoted are adopted
Gender related opportunities	High yields will encourage commercialization thus attract youth in cassava industry
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> None
VMG related opportunities	<ul style="list-style-type: none"> None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	<ul style="list-style-type: none"> Establishment of cassava commercial villages in Makuani, Mbuvi, and Busia County, Tanganyika Improved income generation from adoption of Tajirika variety in Kilifi County
Application guidelines for users	
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	<ul style="list-style-type: none"> Ready for up-scaling in Busia and Kisumu Counties Requires validation in Lamu County
G: Contacts	H. Obiero C/O Centre Director KALRO Kakamega Box 169 - 50100 Tel 05631753 or 05630031. Email: kalrokakamega@kalro.org
Lead organization and scientists	KALRO Kivuva B. M., Munga T.L and Woyengo V.W
Partner organizations	<ul style="list-style-type: none"> KALRO-Avail breeder's seed and technical backstopping Universities-Technical backstopping and tissue culture services National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services Kenya Plant Health Inspectorate Services (KEPHIS)-Seed certification

	<ul style="list-style-type: none"> • CBOs, NGO's- Seed multiplication and technology dissemination • Processors: Create demand for variety • Farmers: Test/validate and produce • CGIARS e.g IITA- Funding and technical backstopping • Donors: Funding
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2.1.7 TIMP Name	Cassava variety Shibe
Category	<ul style="list-style-type: none"> • Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Improved cassava yield is limited by lack of high yielding varieties that are pest and disease tolerant. This variety is high yielding and tolerant to CBSD and therefore would improve the yield if cultivated.
What is it	The variety is resistant to CMV, tolerant to CBSD, Straight stems ideal for intercropping, Mature between 8 to 12 months, Optimal production altitude 15-1200mls and rainfall range of 500 mm-1000mm and its Potential yield is 70.1t/ha
Justification	Farmers cultivating low yielding cassava varieties that are late maturing and susceptible to pests and diseases hence there is need to improve and avail to them improved varieties to counter these challenges
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> • Farmers, processors, extension providers, consumers, researchers and seed producers
Approaches to be used in dissemination	<ul style="list-style-type: none"> • Farmers field days, demonstration plots, on-farm trials and agricultural shows
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Preferred traits by farmers, consumers and market niches • Promotion methods used • Involve all cassava stakeholders in the promotion chain
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • KALRO-Avail breeder's seed and technical backstopping • Universities-Technical backstopping and tissue culture services • National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services • Kenya Plant Health Inspectorate Services (KEPHIS)-Seed inspection • CBOs, NGO's- Seed multiplication and technology dissemination • Processors: Create demand for variety • Farmers: Test/validate and produce

	<ul style="list-style-type: none"> CGIARS e.g IITA: Donors: Funding and technical backstopping
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> Kilifi, Kwale , lamu, Machakos Makueni, Kitui, Tharaka , Taita taveta counties
Counties where TIMP will be upscaled / Validated	<ul style="list-style-type: none"> To be validated in Busia and Kisumu and upscaled in Lamu county
Challenges in dissemination	<ul style="list-style-type: none"> Seed unavailability Livestock destruction Limited extension providers Poor perception towards new cassava varieties
Suggestions for addressing the challenges	<ul style="list-style-type: none"> Establish working seed system Use local administration to ensure harmony between livestock and cassava farmers Support improved extension services Campaign for attitude change
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> Successful variety promotion requires availability of ready and consistent market for anticipated increased production
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> Farmers' willingness Favorable weather conditions Availability of market Favorable policies to support seed/production, marketing and value addition
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	<ul style="list-style-type: none"> Approximate KES 46,850 per acre
Estimated returns	<ul style="list-style-type: none"> 70.1 t/acre @ 5 per Kg farm gate= 301,650
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> Involve men and women in testing of varieties to ensure their preferred quality traits and cropping systems are selected
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> Target both men and women in scaling up to ensure varieties promoted are adopted
Gender related opportunities	High yields will encourage commercialization thus attract youth in cassava industry
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> None

VMG related opportunities	<ul style="list-style-type: none"> • None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	<ul style="list-style-type: none"> • Establishment of cassava commercial villages in Makueni, Mbuvo, and Busia County, Tangakona • Improved income generation from adoption of Tajirika variety in Kilifi County
Application guidelines for users	<ul style="list-style-type: none"> • Good agricultural practices
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	<ul style="list-style-type: none"> • Ready for up-scaling in Busia and Kisumu Counties • Requires validation in Lamu County
G: Contacts	Munga T.L C/O Centre Director KALRO Mtwapa Box 16 - 80109 Email: kalro.mtwapa@kalro.org
Lead organization and scientists	KALRO Kivuva B. M., Munga T.L and Woyengo V.W
Partner organizations	<ul style="list-style-type: none"> • KALRO-Avail breeder's seed and technical backstopping • Universities-Technical backstopping and tissue culture services • National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services • Kenya Plant Health Inspectorate Services (KEPHIS)-Seed certification • CBOs, NGO's- Seed multiplication and technology dissemination • Processors: Create demand for variety • Farmers: Test/validate and produce • CGIARS e.g IITA- Funding and technical backstopping • Donors: Funding

2.1.8 TIMP Name	Cassava variety Tajirika
Category	<ul style="list-style-type: none"> • Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Improved cassava yield is limited by lack of high yielding varieties that are pest and disease tolerant. This variety is high yielding and tolerant to CBSD and therefore would improve the yield if cultivated.
What is it	The variety is resistant to CMV, Tolerant to CBSD, Straight stems ideal for intercropping , Matures in 8 months, Optimal production

	altitude 15-1200mls rainfall of 500-1000mm per year and Potential yield is 63.3 t/ha
Justification	Farmers cultivating low yielding cassava varieties that are late maturing and susceptible to pests and diseases hence there is need to improve and avail to them improved varieties to counter these challenges
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> Farmers, processors, extension providers, consumers, researchers and seed producers
Approaches to be used in dissemination	<ul style="list-style-type: none"> Farmers field days, demonstration plots, on-farm trials and agricultural shows
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> Preferred traits by farmers, consumers and market niches Promotion methods used Involve all cassava stakeholders in the promotion chain
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> KALRO-Avail breeder's seed and technical backstopping Universities-Technical backstopping and tissue culture services National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services Kenya Plant Health Inspectorate Services (KEPHIS)-Seed inspection CBOs, NGO's- Seed multiplication and technology dissemination Processors: Create demand for variety Farmers: Test/validate and produce CGIARS e.g IITA: Donors: Funding and technical backstopping
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> Kilifi, Kwale , lamu, Machakos Makueni, Kitui, Tharaka , Taita taveta counties
Counties where TIMP will be upscaled / Validated	<ul style="list-style-type: none"> To be validated in Busia and Kisumu and upscaled in Lamu county
Challenges in dissemination	<ul style="list-style-type: none"> Seed un availability Livestock destruction Limited extension providers Poor perception towards new cassava varieties
Suggestions for addressing the challenges	<ul style="list-style-type: none"> Establish working seed system Use local administration to ensure harmony between livestock and cassava farmers Support improved extension services Campaign for attitude change

Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Successful variety promotion requires availability of ready and consistent market for anticipated increased production
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> • Farmers' willingness • Favorable weather conditions • Availability of market • Favorable policies to support seed/production, marketing and value addition
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	<ul style="list-style-type: none"> • Approximate KES 46,850 per acre
Estimated returns	<ul style="list-style-type: none"> • 63.3 t/acre @ 5 per Kg farm gate= 269,650
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> • Involve men and women in testing of varieties to ensure their preferred quality traits and cropping systems are selected
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • Target both men and women in scaling up to ensure varieties promoted are adopted
Gender related opportunities	High yields will encourage commercialization thus attract youth in cassava industry
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> • None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • None
VMG related opportunities	<ul style="list-style-type: none"> • None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	<ul style="list-style-type: none"> • Establishment of cassava commercial villages in Makueni, Mbuvo, and Busia County, Tangakona • Improved income generation from adoption of Tajirika variety in Kilifi County
Application guidelines for users	<ul style="list-style-type: none"> • Good agricultural practices
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	<ul style="list-style-type: none"> • Ready for up-scaling in Busia and Kisumu Counties • Requires validation in Lamu County
G: Contacts	Munga T.L C/O Centre Director KALRO Mtwapa Box 16 - 80109 Email: kalromtwapa@kalro.org
Lead organization and scientists	KALRO Kivuva B. M., Munga T.L and Woyengo V.W

Partner organizations	<ul style="list-style-type: none"> • KALRO-Avail breeder's seed and technical backstopping • Universities-Technical backstopping and tissue culture services • National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services • Kenya Plant Health Inspectorate Services (KEPHIS)-Seed certification • CBOs, NGO's- Seed multiplication and technology dissemination • Processors: Create demand for variety • Farmers: Test/validate and produce • CGIARS e.g IITA- Funding and technical backstopping • Donors: Funding
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2.1.10 TIMP Name	Cassava variety Nzalauka
Category	<ul style="list-style-type: none"> • Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Improved cassava yield is limited by lack of high yielding varieties that are pest and disease tolerant. This variety is high yielding and tolerant to CBSD and therefore would improve the yield if cultivated.
What is it	The variety is Resistant to CMV, Tolerant to CBSD, Straight stems ideal for intercropping, Matures between 6-8 months. Its Optimal production altitude 15-1200msl, rainfall amount of 500-1000mm/year, and Potential yield is 52.9 t/ha
Justification	Farmers cultivating low yielding cassava varieties that are late maturing and susceptible to pests and diseases hence there is need to improve and avail to them improved varieties to counter these challenges
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> • Farmers, processors, extension providers, consumers, researchers and seed producers
Approaches to be used in dissemination	<ul style="list-style-type: none"> • Farmers field days, demonstration plots, on-farm trials and agricultural shows
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Preferred traits by farmers, consumers and market niches • Promotion methods used • Involve all cassava stakeholders in the promotion chain
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • KALRO-Avail breeder's seed and technical backstopping • Universities-Technical backstopping and tissue culture services • National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services

	<ul style="list-style-type: none"> Kenya Plant Health Inspectorate Services (KEPHIS)- Seed inspection CBOs, NGO's- Seed multiplication and technology dissemination Processors: Create demand for variety Farmers: Test/validate and produce CGIARS e.g IITA: Donors: Funding and technical backstopping
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> Kilifi, Kwale, Lamu, Machakos, Makueni, Kitui, Tharaka, Taita Taveta counties
Counties where TIMP will be upscaled / Validated	<ul style="list-style-type: none"> To be validated in Busia and Kisumu and upscaled in Lamu county
Challenges in dissemination	<ul style="list-style-type: none"> Seed unavailability Livestock destruction Limited extension providers Poor perception towards new cassava varieties
Suggestions for addressing the challenges	<ul style="list-style-type: none"> Establish working seed system Use local administration to ensure harmony between livestock and cassava farmers Support improved extension services Campaign for attitude change
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> Successful variety promotion requires availability of ready and consistent market for anticipated increased production
Social, environmental, policy and market conditions necessary for development and upscaling	<ul style="list-style-type: none"> Farmers' willingness Favorable weather conditions Availability of market Favorable policies to support seed/production, marketing and value addition
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	<ul style="list-style-type: none"> Approximate KES 46,850 per acre
Estimated returns	<ul style="list-style-type: none"> 52.9 t/acre @ 5 per Kg farm gate= 217,650
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> Involve men and women in testing of varieties to ensure their preferred quality traits and cropping systems are selected
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> Target both men and women in scaling up to ensure varieties promoted are adopted
Gender related opportunities	High yields will encourage commercialization thus attract youth in cassava industry

VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> • None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • None
VMG related opportunities	<ul style="list-style-type: none"> • None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	<ul style="list-style-type: none"> • Establishment of cassava commercial villages in Makueni, Mbuvo, and Busia County, Tangakona • Improved income generation from adoption of Tajirika variety in Kilifi County
Application guidelines for users	<ul style="list-style-type: none"> • Good agricultural practices
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	<ul style="list-style-type: none"> • Ready for up-scaling in Busia and Kisumu Counties • Requires validation in Lamu County
G: Contacts	Munga T.L C/O Centre Director KALRO Mtwapa Box 16 - 80109 Email: kalromtwapa@kalro.org
Lead organization and scientists	KALRO Kivuva B. M., Munga T.L and Woyengo V.W
Partner organizations	<ul style="list-style-type: none"> • KALRO-Avail breeder's seed and technical backstopping • Universities-Technical backstopping and tissue culture services • National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services • Kenya Plant Health Inspectorate Services (KEPHIS)-Seed certification • CBOs, NGO's- Seed multiplication and technology dissemination • Processors: Create demand for variety • Farmers: Test/validate and produce • CGIARS e.g IITA- Funding and technical backstopping • Donors: Funding

2.1.11 TIMP Name	Cassava variety Siri
Category	<ul style="list-style-type: none"> • Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Improved cassava yield is limited by lack of high yielding varieties that are pest and disease tolerant. This variety is high yielding and tolerant to CBSD and therefore would improve the yield if cultivated.

What is it	The variety is Resistant to CMV, Tolerant to CBSD, High branching good for intercropping, Matures between 8-12 months, It has Optimal production altitude 15-1200mls, rainfall, 400-100mm/year, and Potential yield is 57.7 t/ha
Justification	Farmers cultivating low yielding cassava varieties that are late maturing and susceptible to pests and diseases hence there is need to improve and avail to them improved varieties to counter these challenges
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> Farmers, processors, extension providers, consumers, researchers and seed producers
Approaches to be used in dissemination	<ul style="list-style-type: none"> Farmers field days, demonstration plots, on-farm trials and agricultural shows
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> Preferred traits by farmers, consumers and market niches Promotion methods used Involve all cassava stakeholders in the promotion chain
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> KALRO-Avail breeder's seed and technical backstopping Universities-Technical backstopping and tissue culture services National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services Kenya Plant Health Inspectorate Services (KEPHIS)-Seed inspection CBOs, NGO's- Seed multiplication and technology dissemination Processors: Create demand for variety Farmers: Test/validate and produce CGIARS e.g IITA: Donors: Funding and technical backstopping
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> Kilifi, Kwale, Lamu, Machakos, Makueni, Kitui, Tharaka, Taita Taveta counties
Counties where TIMP will be upscaled / Validated	<ul style="list-style-type: none"> To be validated in Busia and Kisumu and upscaled in Lamu county
Challenges in dissemination	<ul style="list-style-type: none"> Seed availability Livestock destruction Limited extension providers Poor perception towards new cassava varieties
Suggestions for addressing the challenges	<ul style="list-style-type: none"> Establish working seed system Use local administration to ensure harmony between livestock and cassava farmers Support improved extension services

	<ul style="list-style-type: none"> • Campaign for attitude change
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Successful variety promotion requires availability of ready and consistent market for anticipated increased production
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> • Farmers' willingness • Favorable weather conditions • Availability of market • Favorable policies to support seed/production, marketing and value addition
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	<ul style="list-style-type: none"> • Approximate KES 46,850 per acre
Estimated returns	<ul style="list-style-type: none"> • 57.7 t/acre @ 5 per Kg farm gate= 241,650
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> • Involve men and women in testing of varieties to ensure their preferred quality traits and cropping systems are selected
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • Target both men and women in scaling up to ensure varieties promoted are adopted
Gender related opportunities	High yields will encourage commercialization thus attract youth in cassava industry
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> • None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • None
VMG related opportunities	<ul style="list-style-type: none"> • None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	<ul style="list-style-type: none"> • Establishment of cassava commercial villages in Makueni, Mbuvo, and Busia County, Tangakona • Improved income generation from adoption of Tajirika variety in Kilifi County
Application guidelines for users	
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	<ul style="list-style-type: none"> • Ready for up-scaling in Busia and Kisumu Counties • Requires validation in Lamu County
G: Contacts	Munga T.L C/O Centre Director KALRO Mtwapa Box 16 - 80109 Email: kalromtwapa@kalro.org

Lead organization and scientists	KALRO Kivuva B. M., Munga T.L and Woyengo V.W
Partner organizations	<ul style="list-style-type: none"> • KALRO-Avail breeder's seed and technical backstopping • Universities-Technical backstopping and tissue culture services • National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services • Kenya Plant Health Inspectorate Services (KEPHIS)-Seed certification • CBOs, NGO's- Seed multiplication and technology dissemination • Processors: Create demand for variety • Farmers: Test/validate and produce • CGIARS e.g IITA- Funding and technical backstopping • Donors: Funding

2.1.12 TIMP Name	Cassava variety Karibuni
Category	<ul style="list-style-type: none"> • Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Improved cassava yield is limited by lack of high yielding varieties that are pest and disease tolerant. This variety is high yielding and tolerant to CBSD and therefore would improve the yield if cultivated.
What is it	The variety is Resistant to CMV, Tolerant to CBSD, Short with open canopy, Matures between 8 months, Optimal production altitude 15-1200mls, rainfall amount of 400-1000mm per year and has Potential yield of 68.2 t/ha
Justification	Farmers cultivating low yielding cassava varieties that are late maturing and susceptible to pests and diseases hence there is need to improve and avail to them improved varieties to counter these challenges
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> • Farmers, processors, extension providers, consumers, researchers and seed producers
Approaches to be used in dissemination	<ul style="list-style-type: none"> • Farmers field days, demonstration plots, on-farm trials and agricultural shows
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Preferred traits by farmers, consumers and market niches • Promotion methods used • Involve all cassava stakeholders in the promotion chain
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • KALRO-Avail breeder's seed and technical backstopping • Universities-Technical backstopping and tissue culture services

	<ul style="list-style-type: none"> National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services Kenya Plant Health Inspectorate Services (KEPHIS)-Seed inspection CBOs, NGO's- Seed multiplication and technology dissemination Processors: Create demand for variety Farmers: Test/validate and produce CGIARS e.g IITA: Donors: Funding and technical backstopping
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> Kilifi, Kwale , lamu, Machakos Makueni, Kitui, Tharaka , Taita taveta counties
Counties where TIMP will be upscaled / Validated	<ul style="list-style-type: none"> To be validated in Busia and Kisumu and upscaled in Lamu county
Challenges in dissemination	<ul style="list-style-type: none"> Seed unavailability Livestock destruction Limited extension providers Poor perception towards new cassava varieties
Suggestions for addressing the challenges	<ul style="list-style-type: none"> Establish working seed system Use local administration to ensure harmony between livestock and cassava farmers Support improved extension services Campaign for attitude change
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> Successful variety promotion requires availability of ready and consistent market for anticipated increased production
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> Farmers' willingness Favorable weather conditions Availability of market Favorable policies to support seed/production, marketing and value addition
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	<ul style="list-style-type: none"> Approximate KES 46,850 per acre
Estimated returns	<ul style="list-style-type: none"> 68.2 t/acre @ 5 per Kg farm gate= 294,000
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> Involve men and women in testing of varieties to ensure their preferred quality traits and cropping systems are selected
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> Target both men and women in scaling up to ensure varieties promoted are adopted

Gender related opportunities	High yields will encourage commercialization thus attract youth in cassava industry
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> • None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • None
VMG related opportunities	<ul style="list-style-type: none"> • None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	<ul style="list-style-type: none"> • Establishment of cassava commercial villages in Makueni, Mbuvo, and Busia County, Tangakona • Improved income generation from adoption of Tajirika variety in Kilifi County
Application guidelines for users	<ul style="list-style-type: none"> • Good agricultural practices
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	<ul style="list-style-type: none"> • Ready for up-scaling in Busia and Kisumu Counties • Requires validation in Lamu County
G: Contacts	Munga T.L C/O Centre Director KALRO Mtwapa Box 16 - 80109 Email: kalromtwapa@kalro.org
Lead organization and scientists	KALRO Kivuva B. M., Munga T.L and Woyengo V.W
Partner organizations	<ul style="list-style-type: none"> • KALRO-Avail breeder's seed and technical backstopping • Universities-Technical backstopping and tissue culture services • National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services • Kenya Plant Health Inspectorate Services (KEPHIS)-Seed certification • CBOs, NGO's- Seed multiplication and technology dissemination • Processors: Create demand for variety • Farmers: Test/validate and produce • CGIARS e.g IITA- Funding and technical backstopping • Donors: Funding

2.1.13 TIMP Name	Cassava variety Siri
Category	<ul style="list-style-type: none"> • Technology
A: Description of the technology, innovation or management practice	

Problem addressed	Improved cassava yield is limited by lack of high yielding varieties that are pest and disease tolerant. This variety is high yielding and tolerant to CBSD and therefore would improve the yield if cultivated.
What is it	The variety is Resistant to CMV, Tolerant to CBSD. Very short and non-branching , Matures between 8-12 months The variety Optimal production altitude 15-1200masl, rainfall of 400-1000mm per year, and its Potential yield is 57.7 t/ha
Justification	Farmers cultivating low yielding cassava varieties that are late maturing and susceptible to pests and diseases hence there is need to improve and avail to them improved varieties to counter these challenges
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> Farmers, processors, extension providers, consumers, researchers and seed producers
Approaches to be used in dissemination	<ul style="list-style-type: none"> Farmers field days, demonstration plots, on-farm trials and agricultural shows
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> Preferred traits by farmers, consumers and market niches Promotion methods used Involve all cassava stakeholders in the promotion chain
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> KALRO-Avail breeder's seed and technical backstopping Universities-Technical backstopping and tissue culture services National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services Kenya Plant Health Inspectorate Services (KEPHIS)-Seed inspection CBOs, NGO's- Seed multiplication and technology dissemination Processors: Create demand for variety Farmers: Test/validate and produce CGIARS e.g IITA: Donors: Funding and technical backstopping
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> Kilifi, Kwale , lamu, Machakos Makueni, Kitui, Tharaka , Taita taveta counties
Counties where TIMP will be upscaled / Validated	<ul style="list-style-type: none"> To be validated in Busia and Kisumu and upscaled in Lamu county
Challenges in dissemination	<ul style="list-style-type: none"> Seed unavailability Livestock destruction Limited extension providers Poor perception towards new cassava varieties

Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Establish working seed system • Use local administration to ensure harmony between livestock and cassava farmers • Support improved extension services • Campaign for attitude change
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Successful variety promotion requires availability of ready and consistent market for anticipated increased production
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> • Farmers' willingness • Favorable weather conditions • Availability of market • Favorable policies to support seed/production, marketing and value addition
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	<ul style="list-style-type: none"> • Approximate KES 46,850 per acre
Estimated returns	<ul style="list-style-type: none"> • 57.7 t/acre @ 5 per Kg farm gate= 238,150
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> • Involve men and women in testing of varieties to ensure their preferred quality traits and cropping systems are selected
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • Target both men and women in scaling up to ensure varieties promoted are adopted
Gender related opportunities	High yields will encourage commercialization thus attract youth in cassava industry
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> • None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • None
VMG related opportunities	<ul style="list-style-type: none"> • None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	<ul style="list-style-type: none"> • Establishment of cassava commercial villages in Makueni, Mbuvo, and Busia County, Tangakona • Improved income generation from adoption of Tajirika variety in Kilifi County
Application guidelines for users	
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	<ul style="list-style-type: none"> • Ready for up-scaling in Busia and Kisumu Counties • Requires validation in Lamu County

G: Contacts	Munga T.L C/O Centre Director KALRO Mtwapa Box 16 - 80109 Email: kalromtwapa@kalro.org
Lead organization and scientists	KALRO Kivuva B. M., Munga T.L and Woyengo V.W
Partner organizations	<ul style="list-style-type: none"> • KALRO-Avail breeder's seed and technical backstopping • Universities-Technical backstopping and tissue culture services • National and County Ministry of Agriculture, Livestock, Fisheries & Irrigation-Extension services • Kenya Plant Health Inspectorate Services (KEPHIS)-Seed certification • CBOs, NGO's- Seed multiplication and technology dissemination • Processors: Create demand for variety • Farmers: Test/validate and produce • CGIARS e.g IITA- Funding and technical backstopping • Donors: Funding

GAP IN VARIETIES TECHNOLOGIES

1. Most varieties not validated in all cassava growing counties
2. Reaction of some varieties to emerging diseases such as CBSD and pests (whiteflies) is not known
3. Market niche for processed products not known
4. National performance trials for advanced potential varieties is required to have better varieties
5. Introgression of CMD and CBSD resistance in released susceptible high yielding released varieties is required
6. There are no early bulking varieties with CMD and CBSD **tolerance** hence the need to develop early bulking varieties (6-8 months) for food and processing
7. So far there are no bio-fortified cassava varieties; there is need to develop varieties bio-fortified with Vitamin A, Fe and Zn

2.2: AGRONOMIC PRACTICES

2.2.1: Planting time

2.2.1 TIMP Name	<ul style="list-style-type: none"> • Planting (Planting time, method and spacing)
Category (i.e. technology, innovation or management practice)	<ul style="list-style-type: none"> • Management practice

A: Description of the technology, innovation or management practice	
Problem addressed	Poor yields due to late poor planting
What is it? (TIMP description)	It is a management practice involving the timely, proper placement and spacing of cassava at establishment. Cassava is planted in the Coastal Counties at the onset of the long rain season in March to April; In Eastern Counties in September-October rains and in Western Counties between March and September. Planting is done using the appropriate planting method and spacing at the right time.
Justification	Late planting and improper planting leads to poor establishment, with consequent poor yields or crop even total crop loss. Timely planting, proper placement and correct spacing is essential for proper crop establishment which and the crop attains the genetic yield potential and thus improving productivity.
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMPs	❖ Cassava farmers, researchers and extension agents
Approaches to be used in dissemination	<ul style="list-style-type: none"> ❖ On-farm demonstrations, ❖ Training ❖ Agricultural shows and fairs ❖ Manuals
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> ❖ Creating awareness of the benefits of the management practice ❖ Willingness of the stakeholders to participate and adopt ❖ Availability of funds to conduct the trials, develop manuals and train
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> ❖ Farmers: validate and adopt ❖ Researchers: package information and train ❖ Extension service providers e.g. (NGOs, CBOs and National and County ministry of agriculture livestock, fisheries and irrigation staff): Participate in TOT, train farmers
C: Current situation and future scaling up	
Counties where already promoted, if any	❖ Cassava growing counties of Machakos, Kitui, Tharaka Nithi, Taita Taveta, Kilifi, Lamu, Kwale Makueni, Bungoma, Busia, Siaya Kisumu, Homa Bay Counties
Counties where TIMP will be upscaled	❖ Busia, Kisumu and Lamu
Challenges in dissemination	<ul style="list-style-type: none"> ❖ Weak collaboration among stakeholders ❖ Lack of funds to demonstrate and practice the required good agronomic practices ❖ Lack of packaged information
Suggestions for addressing the challenges	<ul style="list-style-type: none"> ❖ Strengthen collaboration ❖ Source for funding

	❖ Package the technology appropriately (manuals, fact sheet, brochures and mobile app)
Lessons learned in upscaling, if any	❖ None
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> ❖ The crop will be socially acceptable where promoted ❖ Willingness by stakeholders to embrace the promotion ❖ Favorable environment for cassava cultivation ❖ Enabling policy environment for cassava production and marketing
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	❖ None
Estimated returns	❖
Gender issues and concerns in development, dissemination, adoption and scaling up	<ul style="list-style-type: none"> • Proper planting practices may require more labour and may thus be burdensome to women who do the planting
Gender related opportunities	<ul style="list-style-type: none"> • Improved productivity will lead to enhances food security, incomes and job creation to the benefit of the household, men women and children
VMG issues and concerns in development, dissemination, adoption and scaling up	<ul style="list-style-type: none"> • Proper planting practices may require more labour and may thus be burdensome
VMG related opportunities	Improved productivity will lead to enhances food and security, incomes to the benefit of the household an
E: Case studies/profiles of success stories	
Success stories from previous similar projects	<ul style="list-style-type: none"> • Adoption has led to increased cassava yield in cassava growing counties
Application guidelines for users	<ul style="list-style-type: none"> • GIVE REFERENCE OF AVAILABLE PUBLICSTIONS AND WHERE THEY ARE TO BE FOUND
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	KALRO -Katumani, P.O. Box 340-90100, Machakos Email kalro.katumani. kalro.org Telephone. 0710906600 KALRO -Mtwapa,

	P.O. Box 16 – 80109, Mtwapa Email kalro.mtwapa. kalro.org Telephone. KALRO -Kakamega, P.O. Box 169-50100, Kakamega Email kalro.kakamega. kalro.org Telephone. 05630301
Lead organization and scientists	KALRO Kivuva B. M, Munga T.L. and Woyengo V.W.
Partner organizations	Extension providers eg NGOs CBOs eg. Tangakona Commercial Village, National and County Ministry of Agriculture

2.2.2 TIMP Name	Fertilizer use
Category (i.e. technology, innovation or management practice)	<ul style="list-style-type: none"> • Management practice
A: Description of the technology, innovation or management practice	
Problem addressed	Poor yields due to low soil fertility
What is it? (TIMP description)	Availability of adequate plant nutrients in the soil is required for appropriate plant growth. application of appropriate fertilizers, at proper fertilizer rates and proper application time is therefore required to meet the nutrient deficit in order to maximize yield
Justification	Cassava yields can be enhanced through application of appropriate fertilizer at appropriate rate and proper time of application.
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMPs	❖ Cassava farmers, researchers and extension agents
Approaches to be used in dissemination	<ul style="list-style-type: none"> ❖ On-farm demonstrations, ❖ Training ❖ Agricultural shows and fairs ❖ Manuals
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> ❖ Willingness of the stakeholders to participate and adopt ❖ Availability of funds to conduct the trials, develop manuals and train
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> ❖ Farmers: validate and adopt ❖ Researchers: package and train ❖ Extension service providers eg (NGOs, CBOs and National and County ministry of agriculture livestock, fisheries and irrigation staff): Participate in TOT, train
C: Current situation and future scaling up	
Counties where already promoted, if any	❖ Cassava growing counties of Machakos, Kitui, Tharaka Nithi, Taita Taveta, Kilifi, Lamu, Kwale Makueni, Bungoma, Busia, Siaya Kisumu, Homa Bay Counties
Counties where TIMP will be upscaled	❖ Busia, Kisumu and Lamu
Challenges in dissemination	<ul style="list-style-type: none"> ❖ Weak collaboration among stakeholders ❖ Lack of funds to demonstrate and practice the required good agronomic practices ❖ Lack of packaged information
Suggestions for addressing the challenges	<ul style="list-style-type: none"> ❖ Strengthen collaboration ❖ Source for funding

	❖ Package the technology appropriately (manuals, fact sheet, brochure and mobile app)
Lessons learned in upscaling, if any	❖ None
Social, environmental, policy and market conditions necessary) for development and upscaling	❖ Willingness by stakeholders ❖ Favorable environment
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	❖ None
Estimated returns	❖ Increased yield by proper fertilizer application
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> • Appropriate package and communication media
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • Training to be inclusive men and women in a language that they understand • Training schedule should be sensitive to gender roles and socio-cultural believes of the participants
Gender related opportunities	<ul style="list-style-type: none"> • Enhances food security, income and job creation
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> • None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • None
VMG related opportunities	<ul style="list-style-type: none"> • None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	<ul style="list-style-type: none"> • Adoption has led to increased cassava yield in cassava growing counties
Application guidelines for users	<ul style="list-style-type: none"> • Use of training manuals brochures and leaflets
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling

G: Contacts	<p>KALRO -Katumani, P.O. Box 340-90100, Machakos Email kalro.katamani. kalro.org Telephone. 0710906600</p> <p>KALRO -Mtwapa, P.O. Box 16 – 80109, Mtwapa Email kalro.mtwapa. kalro.org Telephone.</p> <p>KALRO -Kakamega, P.O. Box 169-50100, Kakamega Email kalro.kakamega. kalro.org Telephone. 05630301</p>
Lead organization and scientists	KALRO-Katamani, KALRO-Mtwapa and KALRO-Kakamega Kivuva B. M, Munga T.L. and Woyengo V.W.
Partner organizations	, Extension providers eg NGOs CBOs eg. Tangakona Commercial Village, National and County Ministry of Agriculture

2.2.3 TIMP Name	Weed Management
Category (i.e. technology, innovation or management practice)	<ul style="list-style-type: none"> • Management practice
A: Description of the technology, innovation or management practice	
Problem addressed	Poor yields due to poor weed management practices
What is it? (TIMP description)	Use appropriate weed management practices to reduce weeds/cassava compete for nutrients
Justification	Weeds reduce yields and can cause upto 50% yield loss in crops and also affect quality. Weeding may constitute one of the highest production costs in crop husbandry. Improper weeding practices may result in continuous costly weed infestations. Timely and appropriate weed management practices minimizes damage to the environment and minimizes cassava/weed competition for nutrients and soil moisture allowing a crop to attaining potential yield
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMPs	❖ Cassava farmers, researchers and extension agents
Approaches to be used in dissemination	<ul style="list-style-type: none"> ❖ On-farm demonstrations, ❖ Training ❖ Agricultural shows and fairs ❖ Manuals
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> ❖ Willingness of the stakeholders to participate and adopt ❖ Availability of funds to conduct the trials, develop manuals and train
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> ❖ Farmers: validate and adopt ❖ Researchers: package and train ❖ Extension service providers eg (NGOs, CBOs and National and County ministry of agriculture livestock, fisheries and irrigation staff): Participate in TOT, train
C: Current situation and future scaling up	
Counties where already promoted, if any	❖ Cassava growing counties of Machakos, Kitui, Tharaka Nithi, Taita Taveta, Kilifi, Lamu, Kwale Makueni, Bungoma, Busia, Siaya Kisumu, Homa Bay Counties
Counties where TIMP will be upscaled	❖ Busia, Kisumu and Lamu
Challenges in dissemination	<ul style="list-style-type: none"> ❖ Weak collaboration among stakeholders ❖ Lack of funds to demonstrate and practice the required good agronomic practices ❖ Lack of packaged information

Suggestions for addressing the challenges	<ul style="list-style-type: none"> ❖ Strengthen collaboration ❖ Source for funding ❖ Package the technology appropriately (manuals, fact sheet, brochure and mobile app)
Lessons learned in upscaling, if any	❖ None
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> ❖ Willingness by stakeholders ❖ Favorable environment
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	❖ None
Estimated returns	❖ Increased yield by proper weed management practices
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> • Appropriate package and communication media
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • Training to be inclusive men and women in a language that they understand • Training schedule should be sensitive to gender roles and socio-cultural believes of the participants
Gender related opportunities	<ul style="list-style-type: none"> • Enhances food security, income and job creation
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> • None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • None
VMG related opportunities	<ul style="list-style-type: none"> • None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	<ul style="list-style-type: none"> • Adoption has led to increased cassava yield in cassava growing counties
Application guidelines for users	<ul style="list-style-type: none"> • Use of training manuals brochures and leaflets
F: Status of TIMP readiness (1-ready for upscaling; 2-requires	Ready for upscaling

validation; 3-requires further research)	
G: Contacts	<p>KALRO -Katumani, P.O. Box 340-90100, Machakos Email kalro.katumani. kalro.org Telephone. 0710906600</p> <p>KALRO -Mtwapa, P.O. Box 16 – 80109, Mtwapa Email kalro.mtwapa. kalro.org Telephone.</p> <p>KALRO -Kakamega, P.O. Box 169-50100, Kakamega Email kalro.kakamega. kalro.org Telephone. 05630301</p>
Lead organization and scientists	KALRO-Katumani, KALRO-Mtwapa and KALRO-Kakamega Kivuva B. M, Munga T.L. and Woyengo V.W.
Partner organizations	, Extension providers eg NGOs CBOs eg. Tangakona Commercial Village, National and County Ministry of Agriculture

2.2.6 TIMP Name	Intercropping
Category (i.e. technology, innovation or management practice)	<ul style="list-style-type: none"> • Management practice
A: Description of the technology, innovation or management practice	
Problem addressed	<ul style="list-style-type: none"> ❖ Limited returns per unit input used (land, capital and labour) ❖ Low resilience to crop losses arising from climate change effects
What is it? (TIMP description)	❖ Plant cassava under appropriate mixed cropping system to maximize returns per unit input and reduce risk due to crop failure
Justification	❖ Cassava production under monocropping expose farmers to high risk incase of crop loss and limits returns per unit input. Moreover, intercropping increases nutrition security, .improves resilience to climate change, increases overall production therefore improved income
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMPs	❖ Cassava farmers, researchers and extension agents
Approaches to be used in dissemination	<ul style="list-style-type: none"> ❖ On-farm demonstrations, ❖ Training ❖ Agricultural shows and fairs ❖ Manuals
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> ❖ Willingness of the stakeholders to participate and adopt ❖ Availability of funds to conduct the trials, develop manuals and train
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> ❖ Farmers: validate and adopt ❖ Researchers: package and train ❖ Extension service providers e.g. (NGOs, CBOs and National and County ministry of agriculture livestock, fisheries and irrigation staff): Participate in TOT, train
C: Current situation and future scaling up	
Counties where already promoted, if any	❖ Cassava growing counties of Machakos, Kitui, Tharaka Nithi, Taita Taveta, Kilifi, Lamu, Kwale Makueni, Bungoma, Busia, Siaya Kisumu, Homa Bay Counties
Counties where TIMP will be upscaled	❖ Busia, Kisumu and Lamu
Challenges in dissemination	<ul style="list-style-type: none"> ❖ Weak collaboration among stakeholders ❖ Lack of funds to demonstrate and practice the required good agronomic practices ❖ Lack of packaged information
Suggestions for addressing the challenges	<ul style="list-style-type: none"> ❖ Strengthen collaboration ❖ Source for funding

	❖ Package the technology appropriately (manuals, fact sheet, brochure and mobile app)
Lessons learned in upscaling, if any	❖ None
Social, environmental, policy and market conditions necessary) for development and upscaling	❖ Willingness by stakeholders ❖ Favorable environment
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	❖ None
Estimated returns	❖ Increased returns per unit input through intercropping
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> • Appropriate package and communication media
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • Training to be inclusive men and women in a language that they understand • Training schedule should be sensitive to gender roles and socio-cultural believes of the participants
Gender related opportunities	<ul style="list-style-type: none"> • Enhances food security, income and job creation
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> • None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • None
VMG related opportunities	<ul style="list-style-type: none"> • None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	<ul style="list-style-type: none"> • Adoption has led to increased cassava yield in cassava growing counties
Application guidelines for users	<ul style="list-style-type: none"> • Use of training manuals brochures and leaflets
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling

G: Contacts	<p>KALRO -Katumani, P.O. Box 340-90100, Machakos Email kalro.katumani. kalro.org Telephone. 0710906600</p> <p>KALRO -Mtwapa, P.O. Box 16 – 80109, Mtwapa Email kalro.mtwapa. kalro.org Telephone.</p> <p>KALRO -Kakamega, P.O. Box 169-50100, Kakamega Email kalro.kakamega. kalro.org Telephone. 05630301</p>
Lead organization and scientists	KALRO-Katumani, KALRO-Mtwapa and KALRO-Kakamega Kivuva B. M, Munga T.L. and Woyengo V.W.
Partner organizations	, Extension providers eg NGOs CBOs eg. Tangakona Commercial Village, National and County Ministry of Agriculture

2.2.7 TIMP Name	<ul style="list-style-type: none"> Harvesting and post harvest handling
Category (i.e. technology, innovation or management practice)	<ul style="list-style-type: none"> Management practice
A: Description of the technology, innovation or management practice	
Problem addressed	Crop losses due to poor harvesting and post harvest handling methods
What is it? (TIMP description)	To carry out timely harvesting of cassava at minimum cost and yield loss
Justification	Untimely and inappropriate methods of cassava harvesting leads to increased cost of harvesting and yield losses
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMPs	❖ Cassava farmers, researchers and extension agents
Approaches to be used in dissemination	<ul style="list-style-type: none"> ❖ On-farm demonstrations, ❖ Training ❖ Agricultural shows and fairs ❖ Manuals
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> ❖ Willingness of the stakeholders to participate and adopt ❖ Availability of funds to conduct the trials, develop manuals and train
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> ❖ Farmers: validate and adopt ❖ Researchers: package and train ❖ Extension service providers eg (NGOs, CBOs and National and County ministry of agriculture livestock, fisheries and irrigation staff): Participate in TOT, train
C: Current situation and future scaling up	
Counties where already promoted, if any	❖ Cassava growing counties of Machakos, Kitui, Tharaka Nithi, Taita Taveta, Kilifi, Lamu, Kwale Makueni, Bungoma, Busia, Siaya Kisumu, Homa Bay Counties
Counties where TIMP will be upscaled	❖ Busia, Kisumu and Lamu
Challenges in dissemination	<ul style="list-style-type: none"> ❖ Weak collaboration among stakeholders ❖ Lack of funds to demonstrate and practice the required good agronomic practices ❖ Lack of packaged information
Suggestions for addressing the challenges	<ul style="list-style-type: none"> ❖ Strengthen collaboration ❖ Source for funding ❖ Package the technology appropriately (manuals, fact sheet, brochure and mobile app)

Lessons learned in upscaling, if any	❖ None
Social, environmental, policy and market conditions necessary) for development and upscaling	❖ Willingness by stakeholders ❖ Favorable environment
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	❖ None
Estimated returns	❖ Increased yields due to minimum yield losses at harvesting time
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> • Appropriate package and communication media
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • Training to be inclusive men and women in a language that they understand • Training schedule should be sensitive to gender roles and socio-cultural believes of the participants
Gender related opportunities	<ul style="list-style-type: none"> • Enhances food security, income and job creation
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> • None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • None
VMG related opportunities	<ul style="list-style-type: none"> • None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	<ul style="list-style-type: none"> • Adoption has led to increased cassava yield in cassava growing counties
Application guidelines for users	<ul style="list-style-type: none"> • Use of training manuals brochures and leaflets
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling

G: Contacts	KALRO -Katumani, P.O. Box 340-90100, Machakos Email kalro.katumani. kalro.org Telephone. 0710906600 KALRO -Mtwapa, P.O. Box 16 – 80109, Mtwapa Email kalro.mtwapa. kalro.org Telephone. KALRO -Kakamega, P.O. Box 169-50100, Kakamega Email kalro.kakamega. kalro.org Telephone. 05630301
Lead organization and scientists	KALRO-Katumani, KALRO-Mtwapa and KALRO-Kakamega Kivuva B. M, Munga T.L. and Woyengo V.W.
Partner organizations	Extension providers eg NGOs CBOs eg. Tangakona Commercial Village, National and County Ministry of Agriculture

GAPS IN AGRONOMIC PRACTICES TECHNOLOGIES

1. Due to climate change leading to changes in onset, distribution, amount of rainfall and temperatures, there is need to determine appropriate time of planting and the effects of late planting customized per region
2. Of late, many varieties have been developed with varying architecture. There is need to validate plant population that optimizes production
3. Though fertilizer is not used in cassava production in Kenya and preliminary, elsewhere, fertilizer is used and increases yield. There is need to validate fertilizer use in cassava in Kenya

2.3.1 TIMP Name	Community based clean seed system
Category (i.e. technology, innovation or management practice)	❖ Innovation
A: Description of the technology, innovation or management practice	
Problem addressed	Low productivity due disease damage arising from infected planting materials..... Inadequate availability of clean cassava seed is caused by lack of adequate clean cassava seed, and Lack of seed multiplication structures which include;Virus cleaning, Tissue culture units, Hardening units, Stock mother plants conservation units, primary, secondary and tertiary multipliers, Seed inspection, Seed marketing and distribution.
What is it? (TIMP description)	Farming community seed delivery system that involves: Stock mother plants conservation units, Virus cleaning, Rapid multiplication through Tissue culture units, Hardening units, and primary, secondary and tertiary multipliers, Registration of multipliers, Seed inspection, Seed marketing and distribution.
Justification	❖ Lack of clean planting material at planting leads to recycling the previous crop hence transmitting viral diseases to next crop. This enhances pests and disease buildup and drastically reduces the yield
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	❖ Cassava farmers, researchers, seed multipliers
Approaches to be used in dissemination	❖ Awareness creation and training of farmer groups ❖ Media? ❖ Field days? ❖
Critical/essential factors for successful promotion	❖ Availability of foundation seed ❖ Adequate promotion through demos and field days ❖ Farmers willingness to participate
Partners/stakeholders for scaling up and their roles	❖ Extension service providers (NGOs, CBOs) National and county ministry of agriculture, Researchers, seed multipliers and KEPHIS
C: Current situation and future scaling up	
Counties where already promoted, if any	Cassava growing counties: Machakos, Kitui, Tharaka Nithi, Taita Taveta, Kilifi , Lamu, Kwale Makueni, Bungoma, Busia, Siaya Kisumu, Homa Bay Counties
Counties where TIMP will be up scaled	Busia, Kisumu and Lamu


Challenges in dissemination	<ul style="list-style-type: none"> ❖ Lack of basic clean seed from breeders ❖ Poor seed multiplication and distribution structures ❖ Poor Management of demos due to limited funds ❖ Poor mobilization of farmers and seed multipliers
Suggestions for addressing the challenges	<ul style="list-style-type: none"> ❖ Promote seed cleaning through tissues culture and thermotherapy ❖ Support breeder seed multiplication blocks on research station in each cassava growing regions ❖ Identify and train farmers/NGOs on seed production to be run as SMEs ❖ Mobilize farmers and seed multipliers to come together and produce seed
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> ❖ Distribution of clean planting materials to farmers without sustainable seed multiplication and delivery system has not been successful
Social, environmental, policy and market conditions necessary for development and upscaling	<ul style="list-style-type: none"> ❖ Willingness of farmers and seed multipliers ❖ Favorable weather conditions ❖ Government policy on seed certification and seed production should be relaxed to allow quality declared standard seed (QDS) certification class (minimum requirements) ❖ Commercialization of cassava seed
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	<ul style="list-style-type: none"> ❖ KES 58,350 per acre
Estimated returns	<ul style="list-style-type: none"> ❖ KES 261,650 per acre
Gender issues and concerns in development, dissemination, adoption and scaling up	<ul style="list-style-type: none"> ❖ Females mainly do the crop husbandry while men do the sales ❖ Gender disparity in management of production and sales of the seed
	<ul style="list-style-type: none"> ❖
Gender related opportunities	<ul style="list-style-type: none"> ❖ Lead members of the community organizations both men and women are trained as seed inspectors and given certificate of practice creating income generation among men, Women and youth leading to their improved livelihood
VMG issues and concerns in development, dissemination, adoption and scaling up	<ul style="list-style-type: none"> ❖ Due to prejudice associated with their social status, VMGs are excluded from access to and benefits from improved technologies. Thus, affirmative action is required to promote the crop for the VMGs including value addition aspects.

VMG issues and concerns in	❖ None
VMG related opportunities	❖ opportunities for income generation
E: Case studies/profiles of success stories	
Success stories from previous similar projects	❖ KALRO and KEPHIS have been training farmers on clean seed production and seed inspection ❖ TangaKona Commercial Village farmers have successful community seed production system. ❖ KALRO has been contracting cassava seed producers
Application guidelines for users	❖ Apply GAP manual on seed production ❖ Follow Seed quality certification protocol ❖ All seed should be inspected by trained seed inspectors
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling in Kisumu, needs validation in Lamu
Contacts	KALRO -Katumani, P.O. Box 340-90100, Machakos Email kalro.katamani. kalro.org Telephone. 0710906600 KALRO -Mtwapa, P.O. Box 16 – 80109, Mtwapa Email kalro.mtwapa. kalro.org Telephone. KALRO -Kakamega, P.O. Box 169-50100, Kakamega Email kalro.kakamega. kalro.org Telephone. 05630301
Lead organization and scientists	KALRO-Katamani, KALRO-Mtwapa and KALRO-Kakamega Kivuva B. M, Munga T.L. and Woyengo V.W.
Partner organizations	Extension Service providers (NGOs e.g. Self Help Africa (SHA)), CBOs e.g. Tangakona Commercial Village, IITA, KEPHIS.


GAPS IN SEED SYSTEMS TECHNOLOGY

1. Need to validate and customize tissue culture protocol for released cassava varieties
2. Validate the module of community seed systems used in Tanzania
3. Lobby for finalization and enactment of the quality declared seed standards for clonally propagated crops-Cassava


2.4. Management of pests and diseases

2.4.1 TIMP Name	Control of Cassava Mosaic Disease (CMD) caused by Begomoviruses 
Category (i.e. technology, innovation or management practice)	Management Practice
A: Description of the technology, innovation or management practice	
Problem addressed	Low productivity due to cassava Mosaic virus disease
What is it? (TIMP description)	It is the application of various management practices to control the CMD. These involve the use of clean planting materials, planting tolerant varieties, control of cross boundaries movement of planting materials among others.
Justification	<ul style="list-style-type: none"> Cassava mosaic disease (CMD) is one of the major causes of low cassava productivity in East and Central Africa. Most farmers are unaware of the disease and its management. Due to its mode of transmission, i.e. through planting materials, white flies vector, the effect of the disease is catastrophic. There is therefore need to control the disease if sustainable production is to be achieved.
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	Cassava farmers, researchers, and extension service providers
Approaches to be used in dissemination	On-farm trials, demo plots, ASK shows, print media, brochures, conferences and journals
Critical/essential factors for successful promotion	Awareness of the benefits of the management practice Willingness of stakeholders to participate
Partners/stakeholders for scaling up and their roles	Scientists: packaging of and training on the technology Extension agents (both private and public): mobilization/sensitization of farmers and extension of the technology Farmers: participate in trainings and adoption of the technology
C: Current situation and future scaling up:	


Counties where already promoted, if any	Counties in Western, Eastern and Coastal Kenya
Counties where TIMP will be upscaled	Busia, Kisumu and Lamu
Challenges in dissemination	Unwillingness of farmers/stakeholders to participate and adopt the technology
Suggestions for addressing the challenges	Proper sensitization of farmers
Lessons learned in upscaling, if any	Uptake is very high but needs to be accompanied by functional seed system
Social, environmental, policy and market conditions necessary for development and upscaling	Willingness of stakeholders to participate Favorable environmental conditions
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	-
Estimated returns	-
Gender issues and concerns in development, dissemination adoption and scaling up	Decisions on which variety to grow are made by women Men women and youth Women
Gender related opportunities	Traditionally, cassava cultivation is a woman's activity and therefore, women farmers have better opportunities in the management and income generation of cassava crop. Increased productivity improves household income and create employment
VMG issues and concerns in adoption and scaling up	
VMG related opportunities	Increased yield improves household income and food security
E: Case studies/profiles of success stories	
Success stories	????
Application guideline for users	
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	KALRO -Katumani, P.O. Box 340-90100, Machakos Email kalro.katumani. kalro.org Telephone. 0710906600 KALRO -Mtwapa, P.O. Box 16 – 80109, Mtwapa Email kalro.mtwapa. kalro.org Telephone. KALRO -Kakamega,

	P.O. Box 169-50100, Kakamega Email kalro.kakamega. kalro.org Telephone. 05630301
Lead organization and scientists	KALRO-Katumani, KALRO-Mtwapa and KALRO-Kakamega Kivuva B. M, Munga T.L. and Woyengo V.W.
Partner organizations	Extension providers eg NGOs CBOs eg. Tangakona Commercial Village, National and County Ministry of Agriculture
2.4.1 TIMP Name	Control of Cassava Brown Streak Disease (CBD)  Source; IITA
Category (i.e. technology, innovation or management practice)	Management Practice
A: Description of the technology, innovation or management practice	
Problem addressed	Low productivity due to cassava CBDSD disease
What is it? (TIMP description)	Management of CBDSD to minimize reduction in cassava productivity
Justification	<ul style="list-style-type: none"> • CBDSD is one of the major causes of low cassava productivity in East and Central Africa. • Most farmers are un aware of the disease and its management • Due to its mode of transmission, ie through planting materials, white flies vector, the effect of the disease is catastrophic • There is need to develop and disseminate IPM practices for CBDSD management
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	Cassava farmers, researchers, and extension service providers
Approaches to be used in dissemination	On-farm trials, demo plots, ASK shows, print media, brochures, conferences and journals
Critical/essential factors for successful promotion	Willingness of stakeholders to participate

Partners/stakeholders for scaling up and their roles	Scientists: packaging and training of the technology Extension agents (both private and public): mobilization/sensitization of farmers and extension of the technology Farmers: participate in trainings and adoption of the technology
C: Current situation and future scaling up:	
Counties where already promoted, if any	Counties in Western, Eastern and Coastal Kenya
Counties where TIMP will be upscaled	Busia, Kisumu and Lamu
Challenges in dissemination	Willingness of farmers/stakeholders to participate and adopt the technology
Suggestions for addressing the challenges	Proper sensitization of farmers
Lessons learned in upscaling, if any	Uptake is very high but needs to be accompanied by functional seed system
Social, environmental, policy and market conditions necessary for development and upscaling	Willingness of stakeholders to participate Favorable environmental conditions
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	-
Estimated returns	-
Gender issues and concerns in development and dissemination	Insure gender balance during trainings Decisions on which variety to grow are made by women
Gender issues and concerns in adoption and scaling up	
Gender related opportunities	Women farmers have better opportunities in the management of cassava crop. Traditionally, cassava cultivation is a woman's activity. Increased productivity increase household income and create employment
VMG issues and concerns in adoption and scaling up	
VMG related opportunities	Increased yield increase household income, food security and employment
E: Case studies/profiles of success stories	
Success stories from previous similar projects	
Application guideline for users	
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	KALRO -Katumani,


	P.O. Box 340-90100, Machakos Email kalro.katamani. kalro.org Telephone. 0710906600 KALRO -Mtwapa, P.O. Box 16 – 80109, Mtwapa Email kalro.mtwapa. kalro.org Telephone. KALRO -Kakamega, P.O. Box 169-50100, Kakamega Email kalro.kakamega. kalro.org Telephone. 05630301
Lead organization and scientists	KALRO-Katamani, KALRO-Mtwapa and KALRO-Kakamega Kivuva B. M, Munga T.L. and Woyengo V.W.
Partner organizations	Extension providers eg NGOs CBOs eg. Tangakona Commercial Village, National and County Ministry of Agriculture
2.4.1 TIMP Name	Control of Cassava Anthracnose (<i>Colletotrichum gloeosporioides f.sp. manihotis</i>)  Source; IITA
Category (i.e. technology, innovation or management practice)	Management Practice
A: Description of the technology, innovation or management practice	
Problem addressed	Low productivity due to Cassava Anthracnose disease
What is it? (TIMP description)	Management of Cassava Anthracnose disease to minimize reduction in cassava productivity
Justification	<ul style="list-style-type: none"> • Cassava Anthracnose disease is one of the major causes of low cassava productivity in East and Central Africa. • Most farmers are unaware of the disease and its management • Due to its mode of transmission, ie through planting materials, white flies vector, the effect of the disease is catastrophic • There is need to develop and disseminate IPM practices for Cassava Anthracnose management

B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	Cassava farmers, researchers, and extension service providers
Approaches to be used in dissemination	On-farm trials, demo plots, ASK shows, print media, brochures, conferences and journals
Critical/essential factors for successful promotion	Willingness of stakeholders to participate
Partners/stakeholders for scaling up and their roles	Scientists: packaging and training of the technology Extension agents (both private and public): mobilization/sensitization of farmers and extension of the technology Farmers: participate in trainings and adoption of the technology
C: Current situation and future scaling up:	
Counties where already promoted, if any	Counties in Western, Eastern and Coastal Kenya
Counties where TIMP will be upscaled	Busia, Kisumu and Lamu
Challenges in dissemination	Willingness of farmers/stakeholders to participate and adopt the technology
Suggestions for addressing the challenges	Proper sensitization of farmers
Lessons learned in upscaling, if any	Uptake is very high but needs to be accompanied by functional seed system
Social, environmental, policy and market conditions necessary for development and upscaling	Willingness of stakeholders to participate Favorable environmental conditions
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	-
Estimated returns	-
Gender issues and concerns in development and dissemination	Insure gender balance during trainings Decisions on which variety to grow are made by women
Gender issues and concerns in adoption and scaling up	
Gender related opportunities	Women farmers have better opportunities in the management of cassava crop. Traditionally, cassava cultivation is a woman's activity. Increased productivity increase household income and create employment
VMG issues and concerns in adoption and scaling up	
VMG related opportunities	Increased yield increase household income, food security and employment
E: Case studies/profiles of success stories	

Success stories from previous similar projects	
Application guideline for users	
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	<p>KALRO -Katumani, P.O. Box 340-90100, Machakos Email kalro.katumani. kalro.org Telephone. 0710906600</p> <p>KALRO -Mtwapa, P.O. Box 16 – 80109, Mtwapa Email kalro.mtwapa. kalro.org Telephone.</p> <p>KALRO -Kakamega, P.O. Box 169-50100, Kakamega Email kalro.kakamega. kalro.org Telephone. 05630301</p>
Lead organization and scientists	KALRO-Katumani, KALRO-Mtwapa and KALRO-Kakamega Kivuva B. M, Munga T.L. and Woyengo V.W.
Partner organizations	Extension providers eg NGOs CBOs eg. Tangakona Commercial Village, National and County Ministry of Agriculture
2.4.1 TIMP Name	<p>Control of cassava bacterial blight disease (<i>Xanthomonas manihotis</i> pv. <i>manihotis</i>)</p> 
Category (i.e. technology, innovation or management practice)	Management Practice
A: Description of the technology, innovation or management practice	
Problem addressed	Low productivity due to cassava bacterial blight disease
What is it? (TIMP description)	Management of cassava bacterial blight disease to minimize reduction in cassava productivity

Justification	<ul style="list-style-type: none"> • cassava bacterial blight disease is one of the major causes of low cassava productivity in East and Central Africa. • Most farmers are unaware of the disease and its management • Due to its mode of transmission, ie through planting materials, white flies vector, the effect of the disease is catastrophic • There is need to develop and disseminate IPM practices for cassava bacterial blight management
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	Cassava farmers, researchers, and extension service providers
Approaches to be used in dissemination	On-farm trials, demo plots, ASK shows, print media, brochures, conferences and journals
Critical/essential factors for successful promotion	Willingness of stakeholders to participate
Partners/stakeholders for scaling up and their roles	<p>Scientists: packaging and training of the technology</p> <p>Extension agents (both private and public): mobilization/sensitization of farmers and extension of the technology</p> <p>Farmers: participate in trainings and adoption of the technology</p>
C: Current situation and future scaling up:	
Counties where already promoted, if any	Counties in Western, Eastern and Coastal Kenya
Counties where TIMP will be upscaled	Busia, Kisumu and Lamu
Challenges in dissemination	Unwillingness of farmers/stakeholders to participate and adopt the technology
Suggestions for addressing the challenges	Proper sensitization of farmers
Lessons learned in upscaling, if any	Uptake is very high but needs to be accompanied by functional seed system
Social, environmental, policy and market conditions necessary for development and upscaling	Willingness of stakeholders to participate Favorable environmental conditions
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	-
Estimated returns	-
Gender issues and concerns in development and dissemination	Insure gender balance during trainings Decisions on which variety to grow are made by women
Gender issues and concerns in adoption and scaling up	


Gender related opportunities	Women farmers have better opportunities in the management of cassava crop. Traditionally, cassava cultivation is a woman's activity. Increased productivity increase household income and create employment
VMG issues and concerns in adoption and scaling up	
VMG related opportunities	Increased yield increase household income, food security and employment
E: Case studies/profiles of success stories	
Success stories from previous similar projects	
Application guideline for users	
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	KALRO -Katumani, P.O. Box 340-90100, Machakos Email kalro.katumani. kalro.org Telephone. 0710906600 KALRO -Mtwapa, P.O. Box 16 – 80109, Mtwapa Email kalro.mtwapa. kalro.org Telephone. KALRO -Kakamega, P.O. Box 169-50100, Kakamega Email kalro.kakamega. kalro.org Telephone. 05630301
Lead organization and scientists	KALRO-Katumani, KALRO-Mtwapa and KALRO-Kakamega Kivuva B. M, Munga T.L. and Woyengo V.W.
Partner organizations	Extension providers eg NGOs CBOs eg. Tangakona Commercial Village, National and County Ministry of Agriculture

2.4.2 TIMP Name	Integrated pest management for Whiteflies (<i>Bemisia tabaci</i>)
	
Category (i.e. technology, innovation or management practice)	Management Practice
A: Description of the technology, innovation or management practice	
Problem addressed	<p>Low productivity in cassava is due to white flies attacks, Household food insecurity, Low family incomes, Limited utilization of cassava which is a cheaper source of carbohydrates in human and animal feed production, Environmentally safe insect pest management practices that enhance cassava productivity and Inadequate cassava processed products</p>
What is it? (TIMP description)	<p>Farmers and Extension staff will be trained on IPM package that prevents/reduces infestations of the cassava by the green mites. The technology involves pruning and destroying infested parts, application of non-toxic recommended products as well as biological control options and value addition during processing.</p>
Justification	<p>Cassava Pests and diseases are a major challenge in its production aggravated by farmers recycling seed cuttings from the previous season's crop. These cuttings are known to carry insect pests and diseases from the previous crop and also, farmers lack the knowhow of pest and diseases management on cassava in Kenya. With insect pest and diseases free planting materials from KALRO to trained farmers at a fee, losses due to green mites will be minimal. Training of spray service providers on best IPM options will create employment as well as achieving pest management targets efficiently. This coupled with capacity building to farmers on good agricultural practices on cassava production</p>

	and entrepreneurship will lead to establishment of cassava as a high value crop in areas suitable for its production
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	Cassava farmers, researchers, environmentalists, county governments, processors, input stockists, industrialists and policy makers
Approaches to be used in dissemination	Extension staff – ToTs, On-farm trials, demo plots, ASK shows, print media, brochures, posters, conferences and journals
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Recruitment of cassava growing farmer groups • Registration of farmers by KEPHIS as seed multipliers • support for companies and SMEs to enter seed production; value addition and product diversification • funding by government to promote production and distribution of seed of selected cassava varieties • Formation of spray service providers (teams) to manage green mites at a fee
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALF&I • KEPHIS • County Governments • NGO's working with farmers • CIP • FAO, • Private seed multipliers • Farmers • Processors
C: Current situation and future scaling up	
Counties where already promoted, if any	–
Counties where TIMP will be up scaled	Need to promote to all cassava growing regions
Challenges in dissemination	<ul style="list-style-type: none"> • Inadequate supply of certified pest free cassava seeds. • Unwillingness of farmers to serve as seed multipliers due to uncertainty of returns • Challenges in meeting the requirements for registration as seed multipliers • Inadequate knowledge on IPM strategies on insect pests infesting cassava and losses attributed to them • Poor linkages in cassava value chain

	<ul style="list-style-type: none"> • Costs associated with certified seed production • Cultural perceptions that cassava is a poor mans' food
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Registration of seed production farmers • Training of stakeholders in IPM options for white flies • Train consumers on nutritional value of cassava • Training of stakeholders on value addition and processing
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Sensitization is necessary for people to appreciate the use of cassava and its products as food and feed. • There is need to create linkages in cassava value chain to maximize production and optimize use
Social, environmental, policy and market conditions necessary for development and upscaling	
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	-
Estimated returns	
Gender issues and concerns in development and dissemination	Gender sensitive especially on spray chemical application associated with men
Gender issues and concerns in adoption and scaling up	Gender sensitive
Gender related opportunities	Gender sensitive
VMG issues and concerns in adoption and scaling up	All-inclusive (women, Men and youth) affair for proper adoption and up-scaling
VMG related opportunities	More household income from increased yield
E: Case studies/profiles of success stories	
Success stories from previous similar projects	–
Application guideline for users	Need for training on establishment of cassava crops, IPM applications, good agricultural practices, processing and marketing of products in a business oriented approach
F: Status of TIMP readiness (1-ready for upscaling;, 2-requires	Ready for up scaling


validation; 3-requires further research)	
G: Contacts	<p>KALRO - Kabete</p> <p>P.O. Box 14733 – 00800, Waiyaki way, Westlands</p> <p>0710808312</p> <p>Email cd.narl@ kalro.org</p>
Lead organization and scientists	KALRO Kabete (Joseph Mulwa, Miriam Otipa, Abel Too & Ruth Amata)
Partner organizations	All Counties, CBOs and NGOs

2.4.2 TIMP Name	Integrated pest management for White scales <i>(Aonidomytilus albus)</i> 
Category (i.e. technology, innovation or management practice)	Management Practice
A: Description of the technology, innovation or management practice	
Problem addressed	Low productivity in cassava is due to white scales attacks, Household food insecurity, Low family incomes, Limited utilization of cassava which is a cheaper source of carbohydrates in human and animal feed production, Environmentally safe insect pest management practices that enhance cassava productivity and Inadequate cassava processed products
What is it? (TIMP description)	Farmers and Extension staff will be trained on IPM package that prevents/reduces infestations of the cassava by the green mites. Severe attacks causes the terminal leaves to die and drop, and the shoot tip looks like a "candle stick". This causes a reduction in tuber yield. The technology involves pruning and destroying infested parts, application of non-toxic recommended products as well as biological control options and value addition during processing
Justification	Cassava is the third most important source of calories in the tropics after rice and corn. Its production is possible under semi-arid conditions and infertile soils. Pests are a major challenge in its production since farmers are known to use cuttings from the previous season's crop. These cuttings are known to carry insect pests from the previous crop and also, farmers are not known to manage any pest on cassava in Kenya. With insect pest free planting materials from KALRO to trained farmers at a fee, losses due to green mites will be minimal. Training of spray service providers on best IPM options will create employment as well as achieving pest management targets efficiently. This coupled with capacity building to farmers on good agricultural practices on cassava production and entrepreneurship will lead to establishment

	cassava as a high value crop in areas suitable for its production
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	Cassava farmers, researchers, environmentalists, county governments, processors, input stockists, industrialists and policy makers
Approaches to be used in dissemination	Extension staff – ToTs, On-farm trials, demo plots, ASK shows, print media, brochures, posters, conferences and journals
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Recruitment of cassava growing farmer groups • Registration of farmers by KEPHIS as seed multipliers • support for companies and SMEs to enter seed production; value addition and product diversification • funding by government to promote production and distribution of seed of selected cassava varieties • Formation of spray service providers (teams) to manage green mites at a fee
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALF&I • KEPHIS • County Governments • NGO's working with farmers • CIP • FAO, • Private seed multipliers • Farmers • Processors
C: Current situation and future scaling up	
Counties where already promoted, if any	–
Counties where TIMP will be up scaled	Need to promote to all cassava growing regions
Challenges in dissemination	<ul style="list-style-type: none"> • Inadequate supply of certified pest free cassava seeds. • Unwillingness of farmers to serve as seed multipliers due to uncertainty of returns • Challenges in registration as seed multipliers • In adequate knowledge on IPM strategies on insect pests infesting cassava and losses attributed to them • Poor linkages in cassava value chain • Costs associated with certified seed production

	<ul style="list-style-type: none"> • Cultural thoughts that cassava is a poor mans' food
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Registration of seed production farmers • Training of stakeholders in IPM options for white flies • Train consumers on nutritional value of cassava • Training of stakeholders on value addition and processing
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Cassava is a high source of nutrition but highly under utilized • Sensitization is necessary for people to appreciate the use of cassava and its products as food and feed. • Inputs in cassava production are less and cheap • There is need to create linkages in cassava value chain to maximize production and optimize use
Social, environmental, policy and market conditions necessary for development and upscaling	Well-coordinated value chain and objective geared approach
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	-
Estimated returns	Severe infestations can cause 20-100% reduction in tuber yield especially during the dry season
Gender issues and concerns in development and dissemination	Gender sensitive
Gender issues and concerns in adoption and scaling up	Gender sensitive
Gender related opportunities	Gender sensitive
VMG issues and concerns in adoption and scaling up	All-inclusive affair for proper adoption and up-scaling
VMG related opportunities	More household income
E: Case studies/profiles of success stories	
Success stories from previous similar projects	–
Application guideline for users	Need for training on establishment of cassava crops, IPM applications, good agricultural practices, processing and marketing of products in a business oriented approach


F: Status of TIMP readiness (1-ready for upscaling;, 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	KALRO -Kabete P.O. Box 14733 -00800 Email cd.narl@ kalro.org
Lead organization and scientists	KALRO Kabete (Joseph Mulwa, Miriam Otipa, Abel Too & Ruth Amata)
Partner organizations	All Counties, CBOs and NGOs

2.4.2 TIMP Name	Integrated Pest Management Package for green mites in cassava 
Category (i.e. technology, innovation or management practice)	Management Practice
A: Description of the technology, innovation or management practice	
Problem addressed	<p>Low productivity in cassava is due to green mites attacks, Household food insecurity, Low family incomes, Limited utilization of cassava which is a cheaper source of carbohydrates in human and animal feed production, Environmentally safe insect pest management practices that enhance cassava productivity and Inadequate cassava processed products</p>
What is it? (TIMP description)	<p>Farmers and Extension staff will be trained on IPM package that prevents/reduces infestations of the cassava by the green mites. Severe attacks causes the terminal leaves to die and drop, and the shoot tip looks like a "candle stick". This causes a reduction in tuber yield. The technology involves pruning and destroying infested parts, application of non-toxic recommended products as well as biological control options and value addition during processing</p>
Justification	<p>Cassava is the third most important source of calories in the tropics after rice and corn. Its production is possible under semi-arid conditions and infertile soils. Pests are a major challenge in its production since farmers are known to use cuttings from the previous season's crop. These cuttings are known to carry insect pests from the previous crop and also, farmers are not known to manage any pest on cassava in Kenya. With insect pest free planting materials from KALRO to trained farmers at a fee, losses due to green mites will be minimal. Training of spray service providers on best IPM options will create employment as well as achieving pest</p>

	management targets efficiently. This coupled with capacity building to farmers on good agricultural practices on cassava production and entrepreneurship will lead to establishment cassava as a high value crop in areas suitable for its production
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	Cassava farmers, researchers, environmentalists, county governments, processors, input stockists, industrialists and policy makers
Approaches to be used in dissemination	Extension staff – ToTs, On-farm trials, demo plots, ASK shows, print media, brochures, posters, conferences and journals
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Recruitment of cassava growing farmer groups • Registration of farmers by KEPHIS as seed multipliers • support for companies and SMEs to enter seed production; value addition and product diversification • funding by government to promote production and distribution of seed of selected cassava varieties • Formation of spray service providers (teams) to manage green mites at a fee
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALF&I • KEPHIS • County Governments • NGO's working with farmers • CIP • FAO, • Private seed multipliers • Farmers • Processors
C: Current situation and future scaling up	
Counties where already promoted, if any	–
Counties where TIMP will be up scaled	Need to promote to all cassava growing regions
Challenges in dissemination	<ul style="list-style-type: none"> • Inadequate supply of certified pest free cassava seeds. • Unwillingness of farmers to serve as seed multipliers due to uncertainty of returns • Challenges in registration as seed multipliers

	<ul style="list-style-type: none"> • In adequate knowledge on IPM strategies on insect pests infesting cassava and losses attributed to them • Poor linkages in cassava value chain • Costs associated with certified seed production • Cultural thoughts that cassava is a poor mans' food
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Registration of seed production farmers • Training of stakeholders in IPM options for white flies • Train consumers on nutritional value of cassava • Training of stakeholders on value addition and processing
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Cassava is a high source of nutrition but highly under utilized • Sensitization is necessary for people to appreciate the use of cassava and its products as food and feed. • Inputs in cassava production are less and cheap • There is need to create linkages in cassava value chain to maximize production and optimize use
Social, environmental, policy and market conditions necessary for development and upscaling	Well-coordinated value chain and objective geared approach
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	-
Estimated returns	Severe infestations can cause 20-100% reduction in tuber yield especially during the dry season
Gender issues and concerns in development and dissemination	Gender sensitive
Gender issues and concerns in adoption and scaling up	Gender sensitive
Gender related opportunities	Gender sensitive
VMG issues and concerns in adoption and scaling up	All-inclusive affair for proper adoption and up-scaling
VMG related opportunities	More household income
E: Case studies/profiles of success stories	
Success stories from previous similar projects	—

Application guideline for users	Need for training on establishment of cassava crops, IPM applications, good agricultural practices, processing and marketing of products in a business oriented approach
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	KALRO -Kabete P.O. Box 14733 -00800 Email cd.narl@ kalro.org
Lead organization and scientists	KALRO Kabete (Joseph Mulwa, Miriam Otipa, Abel Too & Ruth Amata)
Partner organizations	All Counties, CBOs and NGOs


2.4.3 TIMP Name	Integrated Pest Management Package for mealybugs in cassava 
Category (i.e. technology, innovation or management practice)	Management Practice
A: Description of the technology, innovation or management practice	

Problem addressed	Low productivity in cassava is due to mealy bug attacks, Household food insecurity, Low family incomes, Limited utilization of cassava which is a cheaper source of carbohydrates in human and animal feed production, Environmentally safe insect pest management practices that enhance cassava productivity and Inadequate cassava processed products
What is it? (TIMP description)	Cassava cuttings will be sourced from KALRO centres. Farmers will be trained on IPM package that prevents infestations of the cassava by mealybugs which sack plant sap causing wilting of the plant and vectoring of diseases hence low production. The technology involves pruning, application of non-chemical products as well as biological control options and value addition
Justification	Cassava is an important crop whose production is possible under low erratic rainfall conditions and infertile soils. Pests are a major challenge in its production since farmers are known to use cuttings from the previous season's crop, which most of the time have insect pests. A supply of insect pest free planting materials from KALRO to trained farmers every 3 years at a fee can greatly minimize losses from mealybugs. The farmers multiplying seed will be registered and licensed by KEPHIS. This coupled by capacity building of farmers on good agricultural practices on cassava production and entrepreneurship will lead to establishment of the crop as a high value crop in areas suitable for its production
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	Cassava farmers, researchers, environmentalists, county governments, processors, input stockists, industrialists and policy makers
Approaches to be used in dissemination	Extension staff – ToTs, On-farm trials, demo plots, ASK shows, print media, brochures, posters, conferences and journals
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Recruitment of cassava growing farmer groups • Registration of farmers by KEPHIS as seed multipliers • support for companies and SMEs to enter seed production; value addition and product diversification • funding by government to promote production and distribution of seed of selected cassava varieties

Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALF&I • KEPHIS • County Governments • NGO's working with farmers • CIP • FAO, • Private seed multipliers • Farmers • Processors
C: Current situation and future scaling up	
Counties where already promoted, if any	Busia and Makueni
Counties where TIMP will be up scaled	Busia, Kisumu, Makueni and Lamu
Challenges in dissemination	<ul style="list-style-type: none"> • Inadequate supply of certified pest free cassava seeds. • Unwillingness of farmers to serve as seed multipliers due to uncertainty of returns • Challenges in registration as seed multipliers • In adequate knowledge on IPM strategies on insect pests infesting cassava and losses attributed to them • Poor linkages in cassava value chain • Costs associated with certified seed production
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Registration of seed production farmers, • Training of stakeholders in IPM options for mealybugs • Training of stakeholders on value addition and processing
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Cassava is a high source of nutrition but highly under utilized • Sensitization is necessary for people to appreciate the use of cassava and its products as food and feed. • Inputs in cassava production are less and cheap • There is need to create linkages in cassava value chain to maximize production and optimize use
Social, environmental, policy and market conditions necessary for development and upscaling	Well-coordinated value chain and objective geared approach
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	-

Estimated returns	30-50% crop losses have been reported
Gender issues and concerns in development and dissemination	All issues will be incorporated; all gender will participate in development and dissemination of the management practice
Gender issues and concerns in adoption and scaling up	New skills concerning the management should be focused on women since traditionally, it is women who mostly plant cassava
Gender related opportunities	Women farmers have better opportunities in the management of cassava crop. Traditionally, cassava cultivation is a woman's activity.
VMG issues and concerns in adoption and scaling up	All-inclusive affair for proper adoption and up-scaling
VMG related opportunities	More household income
E: Case studies/profiles of success stories	
Success stories from previous similar projects	
Application guideline for users	Need for training on establishment of cassava crops, IPM applications, good agricultural practices, processing and marketing of products in a business oriented approach
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	KALRO -Kabete P.O. Box 14733 -00800 Email cd.narl@ kalro.org
Lead organization and scientists	KALRO Kabete (Joseph Mulwa, Miriam Otipa, Abel Too & Ruth Amata)
Partner organizations	All Counties

2.4.4 TIMP Name	Integrated Pest Management Package for moles in cassava Moles (<i>Tachyoryetes splendens</i>) in cassava
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	 <p>Cassava plant stems with soil mounts due to moles</p> <p><u>Source:</u> J. Mulwa</p>
Category (i.e. technology, innovation or management practice)	Management Practice/ Technology
A: Description of the technology, innovation or management practice	
Problem addressed	<ul style="list-style-type: none"> • Low productivity due to mole attacks • Household food insecurity • Low family incomes • Limited utilization of cassava which is a cheaper source of carbohydrates in human and animal feed production • Environmentally safe insect pest management practices that enhance cassava productivity • Inadequate cassava processed products
What is it? (TIMP description)	Farmers and Extension staff will be trained on IPM package that prevents/reduces infestations of the cassava by the moles. Severe attacks on roots cause rots and decays. This causes a reduction in tuber yield. The technology involves trapping and other mechanical as well as physical methods and value addition during processing
Justification	Cassava is the third most important source of calories in the tropics after rice and corn. Its production is possible under semi-arid conditions and infertile soils. Pests are a major challenge in its production since farmers are not known to manage any pest on cassava in Kenya. Training of cassava farmers on best IPM options to deal with moles will create employment as well as achieving pest management targets efficiently. This coupled with capacity building to farmers on good agricultural practices on cassava production and entrepreneurship will lead to establishment of cassava as a high value crop in areas suitable for its production

B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	Cassava farmers, researchers, environmentalists, county governments, processors, input stockists, industrialists and policy makers
Approaches to be used in dissemination	Extension staff – ToTs, On-farm trials, demo plots, ASK shows, print media, brochures, posters, conferences and journals
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Recruitment of cassava growing farmer groups • Registration of farmers by KEPHIS as seed multipliers • support for companies and SMEs to enter seed production; value addition and product diversification • funding by government to promote production and distribution of seed of selected cassava varieties • Formation of mole management teams to manage moles at a fee
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALF&I • KEPHIS • County Governments • NGO's working with farmers • CIP • FAO, • Private seed multipliers • Farmers • Processors
C: Current situation and future scaling up	
Counties where already promoted, if any	–
Counties where TIMP will be up scaled	There is need for promotion in all cassava growing regions in Kenya
Challenges in dissemination	<ul style="list-style-type: none"> • Inadequate supply of certified pest free cassava seeds. • Unwillingness of farmers to serve as seed multipliers due to uncertainty of returns • Challenges in registration as seed multipliers • In adequate knowledge on IPM strategies on insect pests infesting cassava and losses attributed to them • Poor linkages in cassava value chain • Costs associated with certified seed production • Cultural thoughts that cassava is a poor mans' food

Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Registration of seed production farmers • Training of stakeholders in IPM options for white flies • Train consumers on nutritional value of cassava • Training of stakeholders on value addition and processing
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Cassava is a high source of nutrition but highly under utilized • Sensitization is necessary for people to appreciate the use of cassava and its products as food and feed. • Inputs in cassava production are less and cheap • There is need to create linkages in cassava value chain to maximize production and optimize use
Social, environmental, policy and market conditions necessary for development and upscaling	Well-coordinated value chain and objective geared approach
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	-
Estimated returns	Infestations can cause tuber yield reduction of up to 25%.
Gender issues and concerns in development and dissemination	Gender sensitive
Gender issues and concerns in adoption and scaling up	Gender sensitive
Gender related opportunities	Gender sensitive
VMG issues and concerns in adoption and scaling up	All-inclusive affair for proper adoption and up-scaling
VMG related opportunities	More household income
E: Case studies/profiles of success stories	
Success stories from previous similar projects	–
Application guideline for users	Need for training on establishment of cassava crops, IPM applications, good agricultural practices, processing and marketing of products in a business oriented approach
F: Status of TIMP readiness (1-ready for upscaling;, 2-requires	Ready for upscaling

validation; 3-requires further research)	
G: Contacts	KALRO –Kabete P.O. Box 14733 -00800 Email cd.narl@ kalro.org
Lead organization and scientists	KALRO Kabete (Joseph Mulwa, Miriam Otipa, Abel Too & Ruth Amata)
Partner organizations	All Counties, CBOs and NGOs

2.4.5 TIMP Name	Integrated Pest Management Package for two spotted spider mites in cassava
Category (i.e. technology, innovation or management practice)	Management Practice
A: Description of the technology, innovation or management practice	
Problem addressed	<ul style="list-style-type: none"> • Low productivity due to white two spotted spider mites attacks • Household food insecurity • Low family incomes • Limited utilization of cassava which is a cheaper source of carbohydrates in human and animal feed production • Environmentally safe insect pest management practices that enhance cassava productivity • Inadequate cassava processed products
What is it? (TIMP description)	Farmers and Extension staff will be trained on IPM package that prevents/reduces infestations of the cassava by the two spotted spider mites. Attacks on cassava cause leaf curling & subsequent wilting of the plant and vectoring of diseases hence low production. The technology involves pruning and destroying infested parts, application of non-chemical products as well as biological control options and value addition during processing
Justification	Cassava is an important crop whose production is possible under low erratic rainfall conditions and infertile soils. Pests are a major challenge in its production since farmers are known to use cuttings from the previous season's crop. These cuttings are known to insect pests from the previous crop and

	also, farmers are known not to manage any pest on cassava in Kenya. With insect pest free planting materials from KALRO to trained farmers every 3 years at a fee can greatly minimize losses from two spotted spider mites. Training of spray service providers will create employment as well as achieving pest management targets efficiently. This coupled by capacity building of farmers on good agricultural practices on cassava production and entrepreneurship will lead to establishment cassava as a high value crop in areas suitable for its production
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	Cassava farmers, researchers, environmentalists, county governments, processors, input stockists, industrialists and policy makers
Approaches to be used in dissemination	Extension staff – ToTs, On-farm trials, demo plots, ASK shows, print media, brochures, posters, conferences and journals
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Recruitment of cassava growing farmer groups • Registration of farmers by KEPHIS as seed multipliers • support for companies and SMEs to enter seed production; value addition and product diversification • funding by government to promote production and distribution of seed of selected cassava varieties • Formation of spray service providers (teams) to manage two spotted spider mites at a fee
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALF&I • KEPHIS • County Governments • NGO's working with farmers • CIP • FAO, • Private seed multipliers • Farmers • Processors
C: Current situation and future scaling up	
Counties where already promoted, if any	–
Counties where TIMP will be up scaled	Should be promoted in all major cassava growing areas in Kenya

Challenges in dissemination	<ul style="list-style-type: none"> • Inadequate supply of certified pest free cassava seeds. • Unwillingness of farmers to serve as seed multipliers due to uncertainty of returns • Challenges in registration as seed multipliers • In adequate knowledge on IPM strategies on insect pests infesting cassava and losses attributed to them • Poor linkages in cassava value chain • Costs associated with certified seed production • Cultural thoughts that cassava is a poor mans' food
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Registration of seed production farmers • Training of stakeholders in IPM options for white flies • Train consumers on nutritional value of cassava • Training of stakeholders on value addition and processing
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Cassava is a high source of nutrition but highly under utilized • Sensitization is necessary for people to appreciate the use of cassava and its products as food and feed. • Inputs in cassava production are less and cheap • There is need to create linkages in cassava value chain to maximize production and optimize use
Social, environmental, policy and market conditions necessary for development and upscaling	Well-coordinated value chain and objective geared approach
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	-
Estimated returns	It is estimated that two spotted spider mites may cause 20-80% crop loss depending on infestation levels
Gender issues and concerns in development and dissemination	Gender sensitive
Gender issues and concerns in adoption and scaling up	Gender sensitive
Gender related opportunities	Gender sensitive
VMG issues and concerns in adoption and scaling up	All-inclusive affair for proper adoption and up-scaling
VMG related opportunities	More household income

E: Case studies/profiles of success stories	
Success stories from previous similar projects	–
Application guideline for users	Need for training on establishment of cassava crops, IPM applications, good agricultural practices, processing and marketing of products in a business oriented approach
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	KALRO -Kabete P.O. Box 14733 -00800 Email cd.narl@ kalro.org
Lead organization and scientists	KALRO Kabete (Joseph Mulwa, Miriam Otipa, Abel Too & Ruth Amata)
Partner organizations	All Counties, CBOs and NGOs

2.4.6 TIMP Name	Integrated Pest Management Package for white scales in cassava
Category (i.e. technology, innovation or management practice)	Management Practice
A: Description of the technology, innovation or management practice	
Problem addressed	<ul style="list-style-type: none"> • Low productivity due to white scales attacks • Household food insecurity • Low family incomes • Limited utilization of cassava which is a cheaper source of carbohydrates in human and animal feed production • Environmentally safe insect pest management practices that enhance cassava productivity • Inadequate cassava processed products
What is it? (TIMP description)	Farmers and Extension staff will be trained on IPM package that prevents/reduces infestations of the cassava by the white scales. Sap sucking by this pest causes wilting of the plant and vectoring of diseases hence low production. The technology involves pruning and destroying infested parts, application of non-chemical products as well as biological control options and value addition during processing
Justification	Cassava is the third most important source of calories in the tropics after rice and corn. Its production is possible under semi-arid conditions and infertile soils. Pests are a major challenge in its production since farmers are known to use cuttings from the previous season's crop. These cuttings are known to insect pests from the previous crop and also, farmers are known not to manage any pest on cassava in Kenya. With insect pest free planting materials from KALRO to trained farmers at a fee, losses due to white scale will be minimal. Training of spray service providers will create employment as well as achieving pest management targets efficiently. This coupled with capacity building to farmers on good agricultural practices on cassava production and entrepreneurship will lead to establishment cassava as a high value crop in areas suitable for its production
B: Assessment of dissemination and scaling up/out approaches	

Users of TIMP	Cassava farmers, researchers, environmentalists, county governments, processors, input stockists, industrialists and policy makers
Approaches to be used in dissemination	Extension staff – ToTs, On-farm trials, demo plots, ASK shows, print media, brochures, posters, conferences and journals
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Recruitment of cassava growing farmer groups • Registration of farmers by KEPHIS as seed multipliers • support for companies and SMEs to enter seed production; value addition and product diversification • funding by government to promote production and distribution of seed of selected cassava varieties • Formation of spray service providers (teams) to manage white at a fee
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALF&I • KEPHIS • County Governments • NGO's working with farmers • CIP • FAO, • Private seed multipliers • Farmers • Processors
C: Current situation and future scaling up	
Counties where already promoted, if any	Busia and Makueni
Counties where TIMP will be up scaled	Busia, Kisumu, Makueni, Machakos and Lamu
Challenges in dissemination	<ul style="list-style-type: none"> • Inadequate supply of certified pest free cassava seeds. • Unwillingness of farmers to serve as seed multipliers due to uncertainty of returns • Challenges in registration as seed multipliers • In adequate knowledge on IPM strategies on insect pests infesting cassava and losses attributed to them • Poor linkages in cassava value chain • Costs associated with certified seed production • Cultural thoughts that cassava is a poor mans' food
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Registration of seed production farmers • Training of stakeholders in IPM options for white flies • Train consumers on nutritional value of cassava

	<ul style="list-style-type: none"> • Training of stakeholders on value addition and processing
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Cassava is a high source of nutrition but highly under utilized • Sensitization is necessary for people to appreciate the use of cassava and its products as food and feed. • Inputs in cassava production are less and cheap • There is need to create linkages in cassava value chain to maximize production and optimize use
Social, environmental, policy and market conditions necessary for development and upscaling	Well-coordinated value chain and objective geared approach
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	-
Estimated returns	These are minor pests but attacks during the dry season can cause serious losses
Gender issues and concerns in development and dissemination	Gender sensitive
Gender issues and concerns in adoption and scaling up	Gender sensitive
Gender related opportunities	Gender sensitive
VMG issues and concerns in adoption and scaling up	All-inclusive affair for proper adoption and up-scaling
VMG related opportunities	More household income
E: Case studies/profiles of success stories	
Success stories from previous similar projects	—
Application guideline for users	Need for training on establishment of cassava crops, IPM applications, good agricultural practices, processing and marketing of products in a business oriented approach
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling

G: Contacts	KALRO -Kabete P.O. Box 14733 -00800 Email cd.narl@ kalro.org
Lead organization and scientists	KALRO Kabete (Joseph Mulwa, Miriam Otipa, Abel Too & Ruth Amata)
Partner organizations	All Counties, CBOs and NGOs

2.4.7 TIMP Name	Integrated Pest Management Package for white flies in cassava
Category (i.e. technology, innovation or management practice)	Management Practice
A: Description of the technology, innovation or management practice	
Problem addressed	<ul style="list-style-type: none"> • Low productivity due to white flies attacks • Household food insecurity • Low family incomes • Limited utilization of cassava which is a cheaper source of carbohydrates in human and animal feed production • Environmentally safe insect pest management practices that enhance cassava productivity • Inadequate cassava processed products
What is it? (TIMP description)	Cassava cuttings will be sourced from KALRO centres. Farmers will be trained on IPM package that prevents/reduces infestations of the cassava by white flies which suck plant sap causing wilting of the plant and vectoring of diseases hence low production. The technology involves pruning, application of non-chemical products as well as biological control options and value addition
Justification	Cassava is an important crop whose production is possible under low erratic rainfall conditions and infertile soils. Pests are a major challenge in its production since farmers are known to use cuttings from the previous season's crop, which most of the time have insect pests. A supply of insect pest free planting materials from KALRO to trained farmers every 3 years at a fee can greatly minimize losses from white

	flies. The farmers multiplying seed will be registered and licensed by KEPHIS. This coupled with capacity building of farmers on good agricultural practices on cassava production and entrepreneurship will lead to establishment of cassava as a high value crop in areas suitable for its production
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	Cassava farmers, researchers, environmentalists, county governments, processors, input stockists, industrialists and policy makers
Approaches to be used in dissemination	Extension staff – ToTs, On-farm trials, demo plots, ASK shows, print media, brochures, posters, conferences and journals
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Recruitment of cassava growing farmer groups • Registration of farmers by KEPHIS as seed multipliers • support for companies and SMEs to enter seed production; value addition and product diversification • funding by government to promote production and distribution of seed of selected cassava varieties • Formation of spray teams to manage white flies at a fee
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALF&I • KEPHIS • County Governments • NGO's working with farmers • CIP • FAO, • Private seed multipliers • Farmers • Processors
C: Current situation and future scaling up	
Counties where already promoted, if any	Busia and Makueni
Counties where TIMP will be up scaled	Busia, Kisumu, Makueni, Machakos and Lamu
Challenges in dissemination	<ul style="list-style-type: none"> • Inadequate supply of certified pest free cassava seeds. • Unwillingness of farmers to serve as seed multipliers due to uncertainty of returns • Challenges in registration as seed multipliers • Inadequate knowledge on IPM strategies on insect pests infesting cassava and losses attributed to them

	<ul style="list-style-type: none"> • Poor linkages in cassava value chain • Costs associated with certified seed production • Cultural thoughts that cassava is a poor mans' food
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Registration of seed production farmers • Training of stakeholders in IPM options for white flies • Train consumers on nutritional value of cassava • Training of stakeholders on value addition and processing
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Cassava is a high source of nutrition but highly under utilized • Sensitization is necessary for people to appreciate the use of cassava and its products as food and feed. • Inputs in cassava production are less and cheap • There is need to create linkages in cassava value chain to maximize production and optimize use
Social, environmental, policy and market conditions necessary for development and upscaling	Well-coordinated value chain and objective geared approach
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	-
Estimated returns	Estimated 30-40% crop loss due to white flies infestation
Gender issues and concerns in development and dissemination	Gender sensitive
Gender issues and concerns in adoption and scaling up	Gender sensitive
Gender related opportunities	Gender sensitive
VMG issues and concerns in adoption and scaling up	All-inclusive affair for proper adoption and up-scaling
VMG related opportunities	More household income
E: Case studies/profiles of success stories	
Success stories from previous similar projects	—

Application guideline for users	Need for training on establishment of cassava crops, IPM applications, good agricultural practices, processing and marketing of products in a business oriented approach
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	KALRO –Kabete P.O. Box 14733 -00800 Email cd.narl@ kalro.org
Lead organization and scientists	KALRO Kabete (Joseph Mulwa, Miriam Otipa, Abel Too & Ruth Amata)
Partner organizations	All Counties, CBOs and NGOs

GAPS IN DISEASES AND PESTS MANAGEMENT TECHNOLOGIES

1. There is no pest and disease surveillance. Therefore there is need for regular surveillance for early warning system
2. There are a number of individual disease and pest management manuals for specific diseases. There is need to compile them in one pest and disease management manual for cassava??
3. There is an online pest and disease diagnostic kit for cassava. There is need to customize it to Kenyan condition and champion for its application by cassava farmers in the Lamu, Kisumu and Busia

2.5 Value addition

2.5.1 TIMP name	Cassava/wheat <i>chapati</i>
Category (i.e. technology, innovation or management practice)	Innovation
A: Description of the technology, innovation or management practice	
Problem addressed	Low uptake of cassava and low incomes from raw cassava
What is it? (TIMP description)	<ul style="list-style-type: none"> • Cassava/wheat <i>chapatti</i> made from composite flour of 25% cassava and 75% wheat flour.
Justification	Blending cassava with wheat flour will reduce the cost of <i>chapati</i> and diversify the use of cassava. This will create demand for increased cassava production for enhanced food security and income generation. It will also save on money used to import wheat
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> • Small scale farmers • Small-scale processors • Restaurants
Approaches to be used in dissemination	<ul style="list-style-type: none"> • ToT • Farmer Participatory Evaluation exercises • Field days • Exhibitions • Agricultural shows • MoA/Extension officers • Partners • Mobile phone text initiative • Farmer to farmer • Mass media • Trainings • Promotional materials (posters/brochures/leaflets)
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Existence of effective extension services to demonstrate the technology • Availability of high quality cassava flours • Availability of quality standards and markets e.g. the Crops (Composite and Blended Flours) Act, 2019 • Government policy encouraging consumption of indigenous foods
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoA: Train and exhibit on chapatti preparation • NGOs / CBOs: Train and exhibit • Cooperatives: Provide funding for women and youth groups • KEBS: Certification
C: Current situation and future scaling up	

Counties where already promoted, if any	<ul style="list-style-type: none"> Coastal lowlands of Kenya
Counties where TIMP will be upscaled	<ul style="list-style-type: none"> Busia, Kisumu and Lamu
Challenges in dissemination	<ul style="list-style-type: none"> Limited awareness of the product by farmers and consumers Limited processing skills at the household level Limited market Negative attitude/ perception towards the product
Suggestions for addressing the challenges	<ul style="list-style-type: none"> Awareness creation about the product and its benefit to farmers, consumers and other value chain actors Capacity building of farmers on how to prepare the product Persistently train and demonstrate and exhibit the products Exchange visits to bench mark
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> Partnership is important in technology dissemination
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> Socially acceptable Favorable perception of the product Enabling policy and standards that encourage cassava blending
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	Not determined
Estimated returns	Not determined
Gender issues and concerns in development, dissemination adoption and scaling up	<p>Women and youth are the key adopters, children, youth, men and women the key consumers.</p> <ul style="list-style-type: none">
	<ul style="list-style-type: none">
Gender related opportunities	<p>Women and youth stand to benefit in production and trade in the product</p> <ul style="list-style-type: none">
VMG issues and concerns in development, dissemination, adoption and scaling up	<ul style="list-style-type: none"> <p>Due to prejudice associated with their social status, VMGs are excluded from access to and benefits from improved technologies. Thus, affirmative action is required to promote the crop for the VMGs including value addition aspects.</p> <p>VMGs stand to gain from improved food security and enhanced incomes.</p>
	<ul style="list-style-type: none">

VMG related opportunities	<p>Opportunity to produce, trade in, and consume locally produced nutritious food products</p> <ul style="list-style-type: none"> •
E: Case studies/profiles of success stories	
Success stories from previous similar projects	None
Application guidelines for users	Cassava chapatti production leaflet
F: Status of TIMP readiness (1-ready for upscaling;, 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	<p>C. K. Katama c/o Centre Director KALRO -Mtwapa P.O. Box 16-80109 Email kalro.mtwapa@kalro.org Telephone. 0710906600</p>
Lead organization and scientists	C. K. Katama, R. W Muiga
Partner organizations	Ministry of Agriculture

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2.5.2 TIMP name	Cassava/ Ugali
Category (i.e. technology, innovation or management practice)	Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Limited use of cassava
What is it? (TIMP description)	Cassava/maize ugali made from composite flour of 25% cassava and 75% maize flour.
Justification	Blending cassava flour with maize flour at 25% for preparing ugali will diversify the use of cassava and reduce the over-dependence on maize flour. This will create demand for increased cassava production for enhanced food security and income generation.
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> • Small scale farmers • Small-scale processors • Restaurants
Approaches to be used in dissemination	<ul style="list-style-type: none"> • ToT • Farmer Participatory Evaluation • Field days • Exhibitions • Agricultural shows • Mobile phone text initiative • Farmer to farmer • Mass media • Trainings • Promotional materials (posters/brochures/leaflets)
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Existence of effective extension services to demonstrate the technology • Availability of high quality cassava flours • Availability of quality standards and markets e.g. the Crops (Composite and Blended Flours) Act, 2019 • Government policy encouraging consumption of indigenous foods
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALFI: Mobilize, train and exhibit the products • NGOs / CBOs: -Mobilize, train and exhibit the products • Cooperatives: Register and train youth/women groups and give loans • KEBS: certification
C: Current situation and future scaling up	

Counties where already promoted, if any	<ul style="list-style-type: none"> • Cassava growing counties in Kenya
Counties where TIMP will be upscaled	<ul style="list-style-type: none"> • Busia, Kisumu and Lamu
Challenges in dissemination	<ul style="list-style-type: none"> • Limited awareness of the product by farmers and consumers • Limited processing technologies at the household level – Known use is boiling and roasting
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Awareness creation about the product to farmers, consumers and other value chain actors • Capacity building of farmers on how to prepare the product • Information dissemination – postharvest handling, value addition, and nutritional attributes of the product • Scaling up participation of end-user in technology development, on-farm activities/adaptive research/extension activities • Promoting awareness to the Government on the savings from foreign exchange used to import wheat, as a result of blending and/or compositing with cassava flour which is locally available.
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Partnership is important in technology dissemination • Making <i>ugali</i> from cassava blended flour has made the product cheaper and more available for sale to rural communities contributing to poverty reduction and increased income generation. • Diversified use of cassava reduces competition maize
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> • Favorable consumer's perception on acceptability of the product • Supportive policy in place e.g. the Country is in the process of developing the Crops Act (Composite and Blended Flours) 2019. • Ability to meet KEBS quality standards
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	Not determined
Estimated returns	Not determined
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> • Processing is mainly done by women, who have limited access and control of resources. Men, women and youth should participate in technology development and dissemination
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • Processing is mainly done by women, who have limited access and control of resources. Men, women and youth should participate in technology adoption and scaling up

Gender related opportunities	Ugali from blended cassava flour is cheaper and thus more profitable and also ensure food security
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> • None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • None.
VMG related opportunities	<ul style="list-style-type: none"> • None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	None
Application guidelines for users	Cassava ugali production leaflet
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	Christine Katama c/o Centre Director, KALRO - Mtwapa, P.O. Box 16-80109 Email kalro.mtwapa.kalro.org Telephone. 0710906600
Lead organization and scientists	C. K. Katama, R. W. Muiga,
Partner organizations	Ministry of Agriculture, Livestock, Fisheries and Irrigation, Farmers

2.5.2 TIMP name	Cassava/ maizeUgali
Category (i.e. technology, innovation or management practice)	Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Limited use of cassava
What is it? (TIMP description)	Cassava/maize ugali made from composite flour of 25% cassava and 75% maize flour.
Justification	Blending cassava flour with maize flour at 25% for preparing ugali will diversify the use of cassava and reduce the over-dependence on maize flour. This will create demand for increased cassava production for enhanced food security and income generation.
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> • Small scale farmers • Small-scale processors • Restaurants

Approaches to be used in dissemination	<ul style="list-style-type: none"> • ToT • Farmer Participatory Evaluation • Field days • Exhibitions • Agricultural shows • Mobile phone text initiative • Farmer to farmer • Mass media • Trainings • Promotional materials (posters/brochures/leaflets)
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Existence of effective extension services to demonstrate the technology • Availability of high quality cassava flours • Availability of quality standards and markets e.g. the Crops (Composite and Blended Flours) Act, 2019 • Government policy encouraging consumption of indigenous foods
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALFI: Mobilize, train and exhibit the products • NGOs / CBOs: -Mobilize, train and exhibit the products • Cooperatives: Register and train youth/women groups and give loans • KEBS: certification
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> • Cassava growing counties in Kenya
Counties where TIMP will be upscaled	<ul style="list-style-type: none"> • Busia, Kisumu and Lamu
Challenges in dissemination	<ul style="list-style-type: none"> • Limited awareness of the product by farmers and consumers • Limited processing technologies at the household level – Known use is boiling and roasting
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Awareness creation about the product to farmers, consumers and other value chain actors • Capacity building of farmers on how to prepare the product • Information dissemination – postharvest handling, value addition, and nutritional attributes of the product • Scaling up participation of end-user in technology development, on-farm activities/adaptive research/extension activities • Promoting awareness to the Government on the savings from foreign exchange used to import wheat, as a result of

	blending and/or compositing with cassava flour which is locally available.
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> Partnership is important in technology dissemination Making <i>ugali</i> from cassava blended flour has made the product cheaper and more available for sale to rural communities contributing to poverty reduction and increased income generation. Diversified use of cassava reduces competition maize
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> Favorable consumer's perception on acceptability of the product Supportive policy in place e.g. the Country is in the process of developing the Crops Act (Composite and Blended Flours) 2019. Ability to meet KEBS quality standards
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	It reduces basic cost by 25%
Estimated returns	Gain by 25%
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> Processing is mainly done by women, but eaten by men, women and the youth. All should participate in technology demonstrations
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> Promote the product by communicating its importance in diet
Gender related opportunities	Ugali from blended cassava flour is cheaper and thus more profitable and also ensure food security
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> None.
VMG related opportunities	<ul style="list-style-type: none"> None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	None
Application guidelines for users	Cassava ugali production leaflet
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	Christine Katama c/o Centre Director, KALRO - Mtwapa, P.O. Box 16-80109 Email kalro.mtwapa.kalro.org Telephone. 0710906600

Lead organization and scientists	C. K. Katama, R. W. Muiga,
Partner organizations	Ministry of Agriculture, Livestock, Fisheries and Irrigation, Farmers

2.5.3 TIMP name	Cassava/millet Ugali
Category (i.e. technology, innovation or management practice)	Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Limited use of cassava
What is it? (TIMP description)	Cassava/millet ugali made from composite flour of 30% cassava and 70% millet flour.
Justification	Blending cassava flour with millet flour at 30% for preparing ugali will diversify the use of cassava and reduce the over-dependence on maize flour. This will create demand for increased cassava production for enhanced food security and income generation.
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> • Small scale farmers • Small-scale processors • Restaurants
Approaches to be used in dissemination	<ul style="list-style-type: none"> • ToT • Farmer Participatory Evaluation • Field days • Exhibitions • Agricultural shows • Mobile phone text initiative • Farmer to farmer • Mass media • Trainings • Promotional materials (posters/brochures/leaflets)
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Existence of effective extension services to demonstrate the technology • Availability of high quality cassava flours • Availability of quality standards and markets e.g. the Crops (Composite and Blended Flours) Act, 2019 • Government policy encouraging consumption of indigenous foods
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALFI: Mobilize, train and exhibit the products • NGOs / CBOs: -Mobilize, train and exhibit the products

	<ul style="list-style-type: none"> • Cooperatives: Register and train youth/women groups and give loans • KEBS: certification
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> • Cassava growing counties in Kenya
Counties where TIMP will be upscaled	<ul style="list-style-type: none"> • Busia, Kisumu and introduced and validated in Lamu
Challenges in dissemination	<ul style="list-style-type: none"> • Limited awareness of the product by farmers and consumers • Limited processing technologies at the household level • Unavailability of millet in Lamu
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Awareness creation about the product to farmers, consumers and other value chain actors • Capacity building of farmers on how to prepare the product • Information dissemination – postharvest handling, value addition, and nutritional attributes of the product • Scaling up participation of end-user in technology development, on-farm activities/adaptive research/extension activities • Promoting awareness to the Government on the savings from foreign exchange used to import maize as a result of blending and/or compositing with millet flour which is locally available in western Kenya and can be grown in drought prone areas.
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Partnership is important in technology dissemination • Making <i>ugali</i> from cassava blended with millet flour has made the product cheaper and more available for sale to rural communities contributing to poverty reduction and increased income generation. • Diversified use of cassava reduces competition for maize
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> • Favorable consumer's perception on acceptability of the product • Supportive policy in place e.g. the Country is in the process of developing the Crops Act (Composite and Blended Flours) 2019. • Ability to meet KEBS quality standards
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	Not determined
Estimated returns	Not determined

Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> Processing is mainly done by women, but eaten by men, women and the youth. All should participate in technology demonstrations
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> Promote the product by communicating its importance in diet
Gender related opportunities	Ugali from blended cassava flour is cheaper and thus more profitable and also ensure food security
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> None.
VMG related opportunities	<ul style="list-style-type: none"> Enhanced food and Nutrition security
E: Case studies/profiles of success stories	
Success stories from previous similar projects	None
Application guidelines for users	Cassava/millet Ugali production leaflet
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	Rhoda Nungo c/o Centre Director, KALRO - Alupe, P.O. Box 278-Busia Kenya Email kalro.alupe@kalro.org
Lead organization and scientists	Rhoda Nungo
Partner organizations	Ministry of Agriculture, Livestock, Fisheries and Irrigation, Farmers

2.5.4 TIMP name	Cassava pigeon-pea porridge
Category (i.e. technology, innovation or management practice)	Technology
A: Description of the technology, innovation or management practice	

Problem addressed	Limited use of cassava
What is it? (TIMP description)	Cassava pigeon-pea porridge made from composite flour of 80% cassava and 20% pigeon pea millet flour with two spoonful of millet flour.
Justification	Blending cassava flour with millet flour at 30% for preparing ugali will diversify the use of cassava and reduce the over-dependence on maize flour. This will create demand for increased cassava production for enhanced food security and income generation.
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> • Small scale farmers • Small-scale processors • Restaurants
Approaches to be used in dissemination	<ul style="list-style-type: none"> • ToT • Farmer Participatory Evaluation • Field days • Exhibitions • Agricultural shows • Mobile phone text initiative • Farmer to farmer • Mass media • Trainings • Promotional materials (posters/brochures/leaflets)
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Existence of effective extension services to demonstrate the technology • Availability of high quality cassava flours • Availability of quality standards and markets e.g. the Crops (Composite and Blended Flours) Act, 2019 • Government policy encouraging consumption of indigenous foods
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALFI: Mobilize, train and exhibit the products • NGOs / CBOs: -Mobilize, train and exhibit the products • Cooperatives: Register and train youth/women groups and give loans • KEBS: certification
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> • Cassava growing counties in western Kenya
Counties where TIMP will be upscaled	<ul style="list-style-type: none"> • Busia, Kisumu and introduced and validated in Lamu
Challenges in dissemination	<ul style="list-style-type: none"> • Limited awareness of the product by farmers and consumers • Limited processing technologies at the household level

Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Awareness creation about the product to farmers, consumers and other value chain actors • Capacity building of farmers on how to prepare the product • Information dissemination – postharvest handling, value addition, and nutritional attributes of the product • Scaling up participation of end-user in technology development, on-farm activities/adaptive research/extension activities
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Partnership is important in technology dissemination • Making <i>uji</i> from cassava blended with pigeon pea flour has made the product more nutritive hence enhancing food security and nutrition to rural communities as well as increasing income generation. • Diversified use of cassava reduces competition for maize
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> • Favorable consumer’s perception on acceptability of the product • Supportive policy in place e.g. the Country is in the process of developing the Crops Act (Composite and Blended Flours) 2019. • Ability to meet KEBS quality standards
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	Not determined
Estimated returns	Not determined
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> • Processing is mainly done by women, but eaten by men, women and the youth. All should participate in technology demonstrations
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • Promote the product by communicating its importance in diet
Gender related opportunities	<i>Uji</i> from enriched cassava flour is more nutrition and food secure
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> • None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • None.
VMG related opportunities	<ul style="list-style-type: none"> • <i>Uji</i> from enriched cassava flour is more nutrition and food secure
E: Case studies/profiles of success stories	
Success stories from previous similar projects	None

Application guidelines for users	Cassava pigeon-pea porridge leaflet
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	Rhoda Nungo c/o Centre Director, KALRO - Alupe, P.O. Box 278-Busia Kenya Email kalro.alupe@kalro.org
Lead organization and scientists	Rhoda Nungo
Partner organizations	Ministry of Agriculture, Livestock, Fisheries and Irrigation, Farmers

2.5.4 TIMP name	Gari (Witabix Mtaani)
Category (i.e. technology, innovation or management practice)	Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Limited cassava products
What is it? (TIMP description)	Gari (Witabix Mtaani) is a ready to use food product made from pan roasted fermented, grated cassava mixed with soya bean flour.
Justification	Grating and fermenting grated cassava mixed with soya flour will diversify cassava use and improve nutritive value. This will create demand for increased cassava production and enhance food and nutrition security and income generation.
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> • Small scale farmers • Small-scale processors • Restaurants
Approaches to be used in dissemination	<ul style="list-style-type: none"> • ToT • Farmer Participatory Evaluation • Field days • Exhibitions • Agricultural shows • Mobile phone text initiative • Farmer to farmer

	<ul style="list-style-type: none"> • Mass media • Trainings • Promotional materials (posters/brochures/leaflets)
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Existence of effective extension services to demonstrate the technology • Availability of high quality cassava flours • Availability of quality standards and markets • Favorable policy
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALFI: Mobilize, train and exhibit the products • NGOs / CBOs: -Mobilize, train and exhibit the products • Cooperatives: Register and train youth/women groups and give loans • KEBS: certification • Supermarkets to accept and stock product for sale
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> • Cassava growing counties in western Kenya
Counties where TIMP will be upscaled	<ul style="list-style-type: none"> • Busia, Kisumu and introduced and validated in Lamu
Challenges in dissemination	<ul style="list-style-type: none"> • Limited awareness of the product by farmers and consumers • Limited processing technologies at the household level • Irregular supply of fresh tubers
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Awareness creation about the product to farmers, consumers and other value chain actors • Capacity building of farmers on how to prepare the product • Information dissemination – postharvest handling, value addition, and nutritional attributes of the product • Scaling up participation of end-user in technology development such as demonstrations and training activities • Promote cassava production all year round
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Partnership is important in technology dissemination • Diversified use of <i>Witabixmtaani</i> reduces competition for wheat
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> • Favorable consumer's perception on acceptability of the product • Supportive policy in place • Ability to meet KEBS quality standards
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	Not determined
Estimated returns	Not determined

Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> Processing is mainly done by women. Involving the youth and men will reduce drudgery for women.
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> Promote the product by involving youth men and traders such as supper markets owners and food processors to enhance acceptability
Gender related opportunities	<ul style="list-style-type: none"> Potential for job creation for youth and enhanced food security
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> None.
VMG related opportunities	<ul style="list-style-type: none"> <i>None</i>
E: Case studies/profiles of success stories	
Success stories from previous similar projects	Product is very popular in Busia Town
Application guidelines for users	<i>Witabixmtaani</i> leaflet
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	Rhoda Nungo c/o Centre Director, KALRO - Alupe, P.O. Box 278-Busia Kenya Email kalro.alupe@ kalro.org
Lead organization and scientists	Rhoda Nungo
Partner organizations	Ministry of Agriculture, Livestock, Fisheries and Irrigation, Farmers

2.5.3 TIMP name	Cassava Crackies
Category (i.e. technology, innovation or management practice)	Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Limited use of cassava
What is it? (TIMP description)	Cassava Crackies is a deep fried snack made from cassava dough passed through nodule machine
Justification	There a narrow range of cassava processed products. Processing cassava to crackies will diversify cassava use, improve nutritive

	value and create demand for increased cassava production. This will enhance food security, income generation and job creation
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> • Small scale farmers • Small-scale processors • Restaurants
Approaches to be used in dissemination	<ul style="list-style-type: none"> • ToT • Farmer Participatory Evaluation • Field days • Exhibitions • Agricultural shows • Mobile phone text initiative • Farmer to farmer • Mass media • Trainings • Promotional materials (posters/brochures/leaflets)
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Existence of effective extension services to demonstrate the technology • Regular availability fresh cassava roots • Availability of quality standards and assured markets • Favorable policy
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALFI: Mobilize, train and exhibit the products • NGOs / CBOs: -Mobilize, train and exhibit the products • Cooperatives: Register and train youth/women groups and give loans • KEBS: certification • Supermarkets to accept and stock product for sale
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> • Cassava growing counties in western Kenya
Counties where TIMP will be upscaled	<ul style="list-style-type: none"> • Busia, Kisumu and introduced and validated in Lamu
Challenges in dissemination	<ul style="list-style-type: none"> • Limited awareness of the product by farmers and consumers • Limited processing technologies at the household level • Irregular supply of fresh tubers
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Awareness creation about the product to farmers, consumers and other value chain actors • Capacity building of farmers on how to prepare the product • Information dissemination – postharvest handling, value addition, and nutritional attributes of the product

	<ul style="list-style-type: none"> Scaling up participation of end-user in technology development such as demonstrations and training activities Promote cassava production all year round
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> Partnership is important in technology dissemination Regular supply of fresh roots important availing product all year round
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> Favorable consumer's perception on acceptability of the product Supportive policy in place Ability to meet KEBS quality standards
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	Not determined
Estimated returns	Not determined
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> Processing is mainly done by women. Involving the youth and men will reduce drudgery for women.
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> Promote the product by involving youth men and traders such as supper markets owners and food processors to enhance acceptability and job creation for youth.
Gender related opportunities	<ul style="list-style-type: none"> Potential for job creation for youth and enhanced food security
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> None.
VMG related opportunities	<ul style="list-style-type: none"> None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	Product is very popular in Busia Town
Application guidelines for users	<i>Cassava crackies</i> leaflet
F: Status of TIMP readiness (1-ready for upscaling;, 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	Rhoda Nungo c/o Centre Director, KALRO - Alupe, P.O. Box 278-Busia Kenya Email kalro.alupe@ kalro.org

Lead organization and scientists	Rhoda Nungo
Partner organizations	Ministry of Agriculture, Livestock, Fisheries and Irrigation, Farmers

2.5.3 TIMP name	High quality cassava flour
Category (i.e. technology, innovation or management practice)	Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Cassava roots have a short shelf life resulting high losses.
What is it? (TIMP description)	High quality cassava flour is fine flour produced from wholesome freshly harvested and rapidly processed cassava roots. The flour is white or cream in color, odorless, bland or sweet in taste, and free from adulterants, insect infestation, sand, peel fragments, dust, and any other impurities.
Justification	Fresh cassava roots are highly perishable. Processing of cassava into high quality cassava flour will extend the shelf life and reduce content of the cyanogenic glucosides to safe limits. High quality and safer cassava flour will ensure consumer confidence in processed products. Cassava flour can be used to partially substitute other flours or starches in bakery products, pastes, noodles, processed or canned meats and diversify cassava use. This will enhance food security, income generation and job creation
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> • Small scale farmers • Small-scale processors • Food processors
Approaches to be used in dissemination	<ul style="list-style-type: none"> • ToT • Field days • Exhibitions • Agricultural shows • Mobile phone text initiative • Farmer to farmer • Mass media • Trainings • Promotional materials (posters/brochures/leaflets)
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Existence of effective extension services to demonstrate the technology • Regular availability fresh cassava roots • Availability of quality standards and assured markets • Favorable policy to promote use of blended flour

Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALFI: Mobilize, train and exhibit the products • NGOs / CBOs: -Mobilize, train and exhibit the products • Cooperatives: Register and train youth/women groups and give loans • KEBS: certification • Processors: To use high quality flour in blended products • Supermarkets to accept and stock product for sale
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> • Cassava growing counties in western Kenya
Counties where TIMP will be upscaled	<ul style="list-style-type: none"> • Busia, Kisumu and introduced and validated in Lamu
Challenges in dissemination	<ul style="list-style-type: none"> • Limited awareness of the product by farmers and consumers • Limited processing technologies at the household level • Irregular supply of fresh tubers • Limited use by processors
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Awareness creation about the product to farmers, consumers and other value chain actors • Capacity building of farmers on how to prepare the product • Information dissemination – postharvest handling, value addition, and nutritional attributes of the product • Scaling up participation of end-user in technology development such as demonstrations and training activities • Promote cassava production all year round • Create an enabling environment for blending
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • It has created demand for cassava and increased farm gate price of fresh root
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> • Favorable consumer's perception on acceptability of the product • Supportive policy in place • Ability to meet KEBS quality standards
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	Not determined
Estimated returns	Not determined
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> • Processing is mainly done by women and require processing machines. Women do have limited access to funds. Affirmative action is needed to finance acquisition of processing equipment to women and youth. This will reduce drudgery for women and job creation.

Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> Processing is mainly done by women and require processing machines. Women do have limited access to funds. Affirmative action is needed to finance acquisition of processing equipment to women and youth. This will reduce drudgery for women and job creation.
Gender related opportunities	<ul style="list-style-type: none"> Potential for job creation for youth and enhanced food security
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> None.
VMG related opportunities	<ul style="list-style-type: none"> None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	Product is very popular in Busia Town
Application guidelines for users	<i>Cassava crackies</i> leaflet
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	Rhoda Nungo c/o Centre Director, KALRO - Alupe, P.O. Box 278-Busia Kenya Email kalro.alupe@kalro.org
Lead organization and scientists	Rhoda Nungo
Partner organizations	Ministry of Agriculture, Livestock, Fisheries and Irrigation, Farmers

2.5 Value addition

2.5.1 TIMP name	Cassava/wheat <i>chapati</i>
Category (i.e. technology, innovation or management practice)	Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Limited use of cassava
What is it? (TIMP description)	<ul style="list-style-type: none"> Cassava/wheat <i>chapatti</i> made from composite flour of 25% cassava and 75% wheat flour.
Justification	Blending cassava with wheat flour will reduce the cost of <i>chapati</i> and diversify the use of cassava. This will create

	demand for increased cassava production for enhanced food security and income generation. It will also save on money used to import wheat
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> • Small scale farmers • Small-scale processors • Restaurants
Approaches to be used in dissemination	<ul style="list-style-type: none"> • ToT • Farmer Participatory Evaluation exercises • Field days • Exhibitions • Agricultural shows • MoA/Extension officers • Partners • Mobile phone text initiative • Farmer to farmer • Mass media • Trainings • Promotional materials (posters/brochures/leaflets)
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Existence of effective extension services to demonstrate the technology • Availability of high quality cassava flours • Availability of quality standards and markets e.g. the Crops (Composite and Blended Flours) Act, 2019 • Government policy encouraging consumption of indigenous foods
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoA: Train and exhibit • NGOs / CBOs: Train and exhibit • Cooperatives: Provide funding for women and youth groups • KEBS: Certification
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> • Coastal lowlands of Kenya
Counties where TIMP will be upscaled	<ul style="list-style-type: none"> • Busia, Kisumu and Lamu
Challenges in dissemination	<ul style="list-style-type: none"> • Limited awareness of the product by farmers and consumers • Limited facilitation • Limited processing skills at the household level • Limited market • Negative attitude/ perception towards the product
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Awareness creation about the product to farmers, consumers and other value chain actors

	<ul style="list-style-type: none"> Capacity building of farmers on how to prepare the product Persistently train and demonstrate and exhibit the products Explain the benefits of the product (economic, quality aspects) Exchange visits to bench mark
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> Partnership is important in technology dissemination Making <i>Chapati</i> from cassava blended flour has made the product cheaper and more available for sale to rural communities contributing to poverty reduction and increased income generation. Diversified use of cassava can help in reducing over-dependency on wheat
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> Ensure safety of the product, Favorable perception of the product Enabling policy and standards that encourage cassava blending
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	Not determined
Estimated returns	Not determined
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> Involve both men and women during product development to ensure acceptability
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> Involve both men and women during product development to ensure acceptability
Gender related opportunities	<ul style="list-style-type: none"> Income generation and food security
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> None
VMG related opportunities	<ul style="list-style-type: none"> None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	None
Application guidelines for users	Cassava chapatti production leaflet
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	C. K. Katama

	c/o Centre Director KALRO -Mtwapa P.O. Box 16-80109 Email kalro.mtwapa@kalro.org Telephone. 0710906600
Lead organization and scientists	C. K. Katama, R. W Muiga
Partner organizations	Ministry of Agriculture

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2.5.2 TIMP name	Cassava/ Ugali
Category (i.e. technology, innovation or management practice)	Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Limited use of cassava
What is it? (TIMP description)	Cassava/maize ugali made from composite flour of 25% cassava and 75% maize flour.
Justification	Blending cassava flour with maize flour at 25% for preparing Ugali will diversify the use of cassava and reduce the over-dependence on maize flour. This will create demand for increased cassava production for enhanced food security and income generation.
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> • Small scale farmers • Small-scale processors • Restaurants
Approaches to be used in dissemination	<ul style="list-style-type: none"> • ToT • Farmer Participatory Evaluation • Field days • Exhibitions • Agricultural shows • Mobile phone text initiative • Farmer to farmer • Mass media • Trainings • Promotional materials (posters/brochures/leaflets)
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Existence of effective extension services to demonstrate the technology • Availability of high quality cassava flours • Availability of quality standards and markets e.g. the Crops (Composite and Blended Flours) Act, 2019 • Government policy encouraging consumption of indigenous foods
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALFI: Mobilize, train and exhibit the products • NGOs / CBOs: -Mobilize, train and exhibit the products • Cooperatives: Register and train youth/women groups and give loans • KEBS: certification
C: Current situation and future scaling up	

Counties where already promoted, if any	<ul style="list-style-type: none"> • Cassava growing counties in Kenya
Counties where TIMP will be upscaled	<ul style="list-style-type: none"> • Busia, Kisumu and Lamu
Challenges in dissemination	<ul style="list-style-type: none"> • Limited awareness of the product by farmers and consumers • Limited processing technologies at the household level – Known use is boiling and roasting
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Awareness creation about the product to farmers, consumers and other value chain actors • Capacity building of farmers on how to prepare the product • Information dissemination – postharvest handling, value addition, and nutritional attributes of the product • Scaling up participation of end-user in technology development, on-farm activities/adaptive research/extension activities • Promoting awareness to the Government on the savings from foreign exchange used to import wheat, as a result of blending and/or compositing with cassava flour which is locally available.
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Partnership is important in technology dissemination • Making <i>ugali</i> from cassava blended flour has made the product cheaper and more available for sale to rural communities contributing to poverty reduction and increased income generation. • Diversified use of cassava reduces competition maize
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> • Favorable consumer's perception on acceptability of the product • Supportive policy in place e.g. the Country is in the process of developing the Crops Act (Composite and Blended Flours) 2019. • Ability to meet KEBS quality standards
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	Not determined
Estimated returns	Not determined
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> • Processing is mainly done by women, who have limited access and control of resources. Men, women and youth should participate in technology development and dissemination
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • Processing is mainly done by women, who have limited access and control of resources. Men, women and youth should participate in technology adoption and scaling up

Gender related opportunities	Ugali from blended cassava flour is cheaper and thus more profitable and also ensure food security
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> • None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • None.
VMG related opportunities	<ul style="list-style-type: none"> • None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	None
Application guidelines for users	Cassava ugali production leaflet
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	Christine Katama c/o Centre Director, KALRO - Mtwapa, P.O. Box 16-80109 Email kalro.mtwapa.kalro.org Telephone. 0710906600
Lead organization and scientists	C. K. Katama, R. W. Muiga,
Partner organizations	Ministry of Agriculture, Livestock, Fisheries and Irrigation, Farmers

2.5.2 TIMP name	Cassava/ maizeUgali
Category (i.e. technology, innovation or management practice)	Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Limited use of cassava
What is it? (TIMP description)	Cassava/maize ugali made from composite flour of 25% cassava and 75% maize flour.
Justification	Blending cassava flour with maize flour at 25% for preparing ugali will diversify the use of cassava and reduce the over-dependence on maize flour. This will create demand for increased cassava production for enhanced food security and income generation.
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> • Small scale farmers • Small-scale processors • Restaurants

Approaches to be used in dissemination	<ul style="list-style-type: none"> • ToT • Farmer Participatory Evaluation • Field days • Exhibitions • Agricultural shows • Mobile phone text initiative • Farmer to farmer • Mass media • Trainings • Promotional materials (posters/brochures/leaflets)
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Existence of effective extension services to demonstrate the technology • Availability of high quality cassava flours • Availability of quality standards and markets e.g. the Crops (Composite and Blended Flours) Act, 2019 • Government policy encouraging consumption of indigenous foods
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALFI: Mobilize, train and exhibit the products • NGOs / CBOs: -Mobilize, train and exhibit the products • Cooperatives: Register and train youth/women groups and give loans • KEBS: certification
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> • Cassava growing counties in Kenya
Counties where TIMP will be upscaled	<ul style="list-style-type: none"> • Busia, Kisumu and Lamu
Challenges in dissemination	<ul style="list-style-type: none"> • Limited awareness of the product by farmers and consumers • Limited processing technologies at the household level – Known use is boiling and roasting
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Awareness creation about the product to farmers, consumers and other value chain actors • Capacity building of farmers on how to prepare the product • Information dissemination – postharvest handling, value addition, and nutritional attributes of the product • Scaling up participation of end-user in technology development, on-farm activities/adaptive research/extension activities • Promoting awareness to the Government on the savings from foreign exchange used to import wheat, as a result of

	blending and/or compositing with cassava flour which is locally available.
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> Partnership is important in technology dissemination Making <i>ugali</i> from cassava blended flour has made the product cheaper and more available for sale to rural communities contributing to poverty reduction and increased income generation. Diversified use of cassava reduces competition maize
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> Favorable consumer's perception on acceptability of the product Supportive policy in place e.g. the Country is in the process of developing the Crops Act (Composite and Blended Flours) 2019. Ability to meet KEBS quality standards
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	It reduces basic cost by 25%
Estimated returns	Gain by 25%
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> Processing is mainly done by women, but eaten by men, women and the youth. All should participate in technology demonstrations
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> Promote the product by communicating its importance in diet
Gender related opportunities	Ugali from blended cassava flour is cheaper and thus more profitable and also ensure food security
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> None.
VMG related opportunities	<ul style="list-style-type: none"> None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	None
Application guidelines for users	Cassava ugali production leaflet
F: Status of TIMP readiness (1-ready for upscaling;, 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	Christine Katama c/o Centre Director, KALRO - Mtwapa, P.O. Box 16-80109 Email kalro.mtwapa.kalro.org Telephone. 0710906600

Lead organization and scientists	C. K. Katama, R. W. Muiga,
Partner organizations	Ministry of Agriculture, Livestock, Fisheries and Irrigation, Farmers

2.5.3 TIMP name	Cassava/millet Ugali
Category (i.e. technology, innovation or management practice)	Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Limited use of cassava
What is it? (TIMP description)	Cassava/millet ugali made from composite flour of 30% cassava and 70% millet flour.
Justification	Blending cassava flour with millet flour at 30% for preparing ugali will diversify the use of cassava and reduce the over-dependence on maize flour. This will create demand for increased cassava production for enhanced food security and income generation.
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> • Small scale farmers • Small-scale processors • Restaurants
Approaches to be used in dissemination	<ul style="list-style-type: none"> • ToT • Farmer Participatory Evaluation • Field days • Exhibitions • Agricultural shows • Mobile phone text initiative • Farmer to farmer • Mass media • Trainings • Promotional materials (posters/brochures/leaflets)
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Existence of effective extension services to demonstrate the technology • Availability of high quality cassava flours • Availability of quality standards and markets e.g. the Crops (Composite and Blended Flours) Act, 2019 • Government policy encouraging consumption of indigenous foods
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALFI: Mobilize, train and exhibit the products • NGOs / CBOs: -Mobilize, train and exhibit the products

	<ul style="list-style-type: none"> • Cooperatives: Register and train youth/women groups and give loans • KEBS: certification
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> • Cassava growing counties in Kenya
Counties where TIMP will be upscaled	<ul style="list-style-type: none"> • Busia, Kisumu and introduced and validated in Lamu
Challenges in dissemination	<ul style="list-style-type: none"> • Limited awareness of the product by farmers and consumers • Limited processing technologies at the household level • Unavailability of millet in Lamu
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Awareness creation about the product to farmers, consumers and other value chain actors • Capacity building of farmers on how to prepare the product • Information dissemination – postharvest handling, value addition, and nutritional attributes of the product • Scaling up participation of end-user in technology development, on-farm activities/adaptive research/extension activities • Promoting awareness to the Government on the savings from foreign exchange used to import maize as a result of blending and/or compositing with millet flour which is locally available in western Kenya and can be grown in drought prone areas.
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Partnership is important in technology dissemination • Making <i>ugali</i> from cassava blended with millet flour has made the product cheaper and more available for sale to rural communities contributing to poverty reduction and increased income generation. • Diversified use of cassava reduces competition for maize
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> • Favorable consumer's perception on acceptability of the product • Supportive policy in place e.g. the Country is in the process of developing the Crops Act (Composite and Blended Flours) 2019. • Ability to meet KEBS quality standards
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	Not determined
Estimated returns	Not determined

Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> Processing is mainly done by women, but eaten by men, women and the youth. All should participate in technology demonstrations
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> Promote the product by communicating its importance in diet
Gender related opportunities	Ugali from blended cassava flour is cheaper and thus more profitable and also ensure food security
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> None.
VMG related opportunities	<ul style="list-style-type: none"> None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	None
Application guidelines for users	Cassava/millet ugali production leaflet
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	Rhoda Nungo c/o Centre Director, KALRO - Alupe, P.O. Box 278-Busia Kenya Email kalro.alupe@kalro.org
Lead organization and scientists	Rhoda Nungo
Partner organizations	Ministry of Agriculture, Livestock, Fisheries and Irrigation, Farmers

2.5.4 TIMP name	Cassava pigeon-pea porridge
Category (i.e. technology, innovation or management practice)	Technology
A: Description of the technology, innovation or management practice	

Problem addressed	Limited use of cassava
What is it? (TIMP description)	Cassava pigeon-pea porridge made from composite flour of 80% cassava and 20% pigeon pea millet flour with two spoonful of millet flour.
Justification	Blending cassava flour with millet flour at 30% for preparing ugali will diversify the use of cassava and reduce the over-dependence on maize flour. This will create demand for increased cassava production for enhanced food security and income generation.
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> • Small scale farmers • Small-scale processors • Restaurants
Approaches to be used in dissemination	<ul style="list-style-type: none"> • ToT • Farmer Participatory Evaluation • Field days • Exhibitions • Agricultural shows • Mobile phone text initiative • Farmer to farmer • Mass media • Trainings • Promotional materials (posters/brochures/leaflets)
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Existence of effective extension services to demonstrate the technology • Availability of high quality cassava flours • Availability of quality standards and markets e.g. the Crops (Composite and Blended Flours) Act, 2019 • Government policy encouraging consumption of indigenous foods
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALFI: Mobilize, train and exhibit the products • NGOs / CBOs: -Mobilize, train and exhibit the products • Cooperatives: Register and train youth/women groups and give loans • KEBS: certification
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> • Cassava growing counties in western Kenya
Counties where TIMP will be upscaled	<ul style="list-style-type: none"> • Busia, Kisumu and introduced and validated in Lamu
Challenges in dissemination	<ul style="list-style-type: none"> • Limited awareness of the product by farmers and consumers • Limited processing technologies at the household level

Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Awareness creation about the product to farmers, consumers and other value chain actors • Capacity building of farmers on how to prepare the product • Information dissemination – postharvest handling, value addition, and nutritional attributes of the product • Scaling up participation of end-user in technology development, on-farm activities/adaptive research/extension activities
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Partnership is important in technology dissemination • Making <i>uji</i> from cassava blended with pigeon pea flour has made the product more nutritive hence enhancing food security and nutrition to rural communities as well as increasing income generation. • Diversified use of cassava reduces competition for maize
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> • Favorable consumer’s perception on acceptability of the product • Supportive policy in place e.g. the Country is in the process of developing the Crops Act (Composite and Blended Flours) 2019. • Ability to meet KEBS quality standards
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	Not determined
Estimated returns	Not determined
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> • Processing is mainly done by women, but eaten by men, women and the youth. All should participate in technology demonstrations
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • Promote the product by communicating its importance in diet
Gender related opportunities	<i>Uji</i> from enriched cassava flour is more nutrition and food secure
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> • None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • None.
VMG related opportunities	<ul style="list-style-type: none"> • <i>Uji</i> from enriched cassava flour is more nutrition and food secure
E: Case studies/profiles of success stories	
Success stories from previous similar projects	None

Application guidelines for users	Cassava pigeon-pea porridge leaflet
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	Rhoda Nungo c/o Centre Director, KALRO - Alupe, P.O. Box 278-Busia Kenya Email kalro.alupe@kalro.org
Lead organization and scientists	Rhoda Nungo
Partner organizations	Ministry of Agriculture, Livestock, Fisheries and Irrigation, Farmers

2.5.4 TIMP name	Gari (Witabix Mtaani)
Category (i.e. technology, innovation or management practice)	Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Limited cassava products
What is it? (TIMP description)	Gari (Witabix Mtaani) is a ready to use food product made from pan roasted fermented, grated cassava mixed with soya bean flour.
Justification	Grating and fermenting grated cassava mixed with soya flour will diversify cassava use and improve nutritive value. This will create demand for increased cassava production and enhance food and nutrition security and income generation.
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> • Small scale farmers • Small-scale processors • Restaurants
Approaches to be used in dissemination	<ul style="list-style-type: none"> • ToT • Farmer Participatory Evaluation • Field days • Exhibitions • Agricultural shows • Mobile phone text initiative • Farmer to farmer

	<ul style="list-style-type: none"> • Mass media • Trainings • Promotional materials (posters/brochures/leaflets)
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Existence of effective extension services to demonstrate the technology • Availability of high quality cassava flours • Availability of quality standards and markets • Favorable policy
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALFI: Mobilize, train and exhibit the products • NGOs / CBOs: -Mobilize, train and exhibit the products • Cooperatives: Register and train youth/women groups and give loans • KEBS: certification • Supermarkets to accept and stock product for sale
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> • Cassava growing counties in western Kenya
Counties where TIMP will be upscaled	<ul style="list-style-type: none"> • Busia, Kisumu and introduced and validated in Lamu
Challenges in dissemination	<ul style="list-style-type: none"> • Limited awareness of the product by farmers and consumers • Limited processing technologies at the household level • Irregular supply of fresh tubers
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Awareness creation about the product to farmers, consumers and other value chain actors • Capacity building of farmers on how to prepare the product • Information dissemination – postharvest handling, value addition, and nutritional attributes of the product • Scaling up participation of end-user in technology development such as demonstrations and training activities • Promote cassava production all year round
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • Partnership is important in technology dissemination • Diversified use of <i>Witabixmtaani</i> reduces competition for wheat
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> • Favorable consumer's perception on acceptability of the product • Supportive policy in place • Ability to meet KEBS quality standards
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	Not determined
Estimated returns	Not determined

Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> Processing is mainly done by women. Involving the youth and men will reduce drudgery for women.
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> Promote the product by involving youth men and traders such as supper markets owners and food processors to enhance acceptability
Gender related opportunities	<ul style="list-style-type: none"> Potential for job creation for youth and enhanced food security
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> None.
VMG related opportunities	<ul style="list-style-type: none"> <i>None</i>
E: Case studies/profiles of success stories	
Success stories from previous similar projects	Product is very popular in Busia Town
Application guidelines for users	<i>Witabixmtaani</i> leaflet
F: Status of TIMP readiness (1-ready for upscaling; 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	Rhoda Nungo c/o Centre Director, KALRO - Alupe, P.O. Box 278-Busia Kenya Email kalro.alupe@ kalro.org
Lead organization and scientists	Rhoda Nungo
Partner organizations	Ministry of Agriculture, Livestock, Fisheries and Irrigation, Farmers

2.5.3 TIMP name	Cassava Crackies
Category (i.e. technology, innovation or management practice)	Technology
A: Description of the technology, innovation or management practice	
Problem addressed	Limited use of cassava
What is it? (TIMP description)	Cassava Crackies is a deep fried snack made from cassava dough passed through nodule machine
Justification	There a narrow range of cassava processed products. Processing cassava to crackies will diversify cassava use, improve nutritive

	value and create demand for increased cassava production. This will enhance food security, income generation and job creation
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMP	<ul style="list-style-type: none"> • Small scale farmers • Small-scale processors • Restaurants
Approaches to be used in dissemination	<ul style="list-style-type: none"> • ToT • Farmer Participatory Evaluation • Field days • Exhibitions • Agricultural shows • Mobile phone text initiative • Farmer to farmer • Mass media • Trainings • Promotional materials (posters/brochures/leaflets)
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Existence of effective extension services to demonstrate the technology • Regular availability fresh cassava roots • Availability of quality standards and assured markets • Favorable policy
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALFI: Mobilize, train and exhibit the products • NGOs / CBOs: -Mobilize, train and exhibit the products • Cooperatives: Register and train youth/women groups and give loans • KEBS: certification • Supermarkets to accept and stock product for sale
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> • Cassava growing counties in western Kenya
Counties where TIMP will be upscaled	<ul style="list-style-type: none"> • Busia, Kisumu and introduced and validated in Lamu
Challenges in dissemination	<ul style="list-style-type: none"> • Limited awareness of the product by farmers and consumers • Limited processing technologies at the household level • Irregular supply of fresh tubers
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Awareness creation about the product to farmers, consumers and other value chain actors • Capacity building of farmers on how to prepare the product • Information dissemination – postharvest handling, value addition, and nutritional attributes of the product

	<ul style="list-style-type: none"> Scaling up participation of end-user in technology development such as demonstrations and training activities Promote cassava production all year round
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> Partnership is important in technology dissemination Regular supply of fresh roots important availing product all year round
Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> Favorable consumer's perception on acceptability of the product Supportive policy in place Ability to meet KEBS quality standards
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	Not determined
Estimated returns	Not determined
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> Processing is mainly done by women. Involving the youth and men will reduce drudgery for women.
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> Promote the product by involving youth men and traders such as supper markets owners and food processors to enhance acceptability and job creation for youth.
Gender related opportunities	<ul style="list-style-type: none"> Potential for job creation for youth and enhanced food security
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> None.
VMG related opportunities	<ul style="list-style-type: none"> None
E: Case studies/profiles of success stories	
Success stories from previous similar projects	Product is very popular in Busia Town
Application guidelines for users	<i>Cassava crackies</i> leaflet
F: Status of TIMP readiness (1-ready for upscaling;, 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	Rhoda Nungo c/o Centre Director, KALRO - Alupe, P.O. Box 278-Busia Kenya Email kalro.alupe@ kalro.org

Lead organization and scientists	Rhoda Nungo
Partner organizations	Ministry of Agriculture, Livestock, Fisheries and Irrigation, Farmers

2.5.4 TIMP name		High quality
Category (i.e. technology, innovation or management practice)	Technology	
A: Description of the technology, innovation or management practice		
Problem addressed	Cassava roots have a short shelf life resulting high losses.	
What is it? (TIMP description)	High quality cassava flour is fine flour produced from wholesome freshly harvested and rapidly processed cassava roots. The flour is white or cream in color, odorless, bland or sweet in taste, and free from adulterants, insect infestation, sand, peel fragments, dust, and any other impurities.	
Justification	Fresh cassava roots are highly perishable. Processing of cassava into high quality cassava flour will extend the shelf life and reduce content of the cyanogenic glucosides to safe limits. High quality and safer cassava flour will ensure consumer confidence in processed products. Cassava flour can be used to partially substitute other flours or starches in bakery products, pastes, noodles, processed or canned meats and diversify cassava use. This will enhance food security, income generation and job creation	
B: Assessment of dissemination and scaling up/out approaches		
Users of TIMP	<ul style="list-style-type: none">• Small scale farmers• Small-scale processors• Food processors	
Approaches to be used in dissemination	<ul style="list-style-type: none">• ToT• Field days• Exhibitions• Agricultural shows• Mobile phone text initiative• Farmer to farmer• Mass media• Trainings• Promotional materials (posters/brochures/leaflets)	

Critical/essential factors for successful promotion	<ul style="list-style-type: none"> • Existence of effective extension services to demonstrate the technology • Regular availability fresh cassava roots • Availability of quality standards and assured markets • Favorable policy to promote use of blended flour
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> • MoALFI: Mobilize, train and exhibit the products • NGOs / CBOs: -Mobilize, train and exhibit the products • Cooperatives: Register and train youth/women groups and give loans • KEBS: certification • Processors: To use high quality flour in blended products • Supermarkets to accept and stock product for sale
C: Current situation and future scaling up	
Counties where already promoted, if any	<ul style="list-style-type: none"> • Cassava growing counties in western Kenya
Counties where TIMP will be upscaled	<ul style="list-style-type: none"> • Busia, Kisumu and introduced and validated in Lamu
Challenges in dissemination	<ul style="list-style-type: none"> • Limited awareness of the product by farmers and consumers • Limited processing technologies at the household level • Irregular supply of fresh tubers • Limited use by processors
Suggestions for addressing the challenges	<ul style="list-style-type: none"> • Awareness creation about the product to farmers, consumers and other value chain actors • Capacity building of farmers on how to prepare the product • Information dissemination – postharvest handling, value addition, and nutritional attributes of the product • Scaling up participation of end-user in technology development such as demonstrations and training activities • Promote cassava production all year round • Create an enabling environment for blending
Lessons learned in upscaling, if any	<ul style="list-style-type: none"> • It has created demand for cassava and increased farm gate price of fresh root

Social, environmental, policy and market conditions necessary) for development and upscaling	<ul style="list-style-type: none"> • Favorable consumer's perception on acceptability of the product • Supportive policy in place • Ability to meet KEBS quality standards
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Basic costs	Not determined
Estimated returns	Not determined
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> • Processing is mainly done by women and require processing machines. Women do have limited access to funds. Affirmative action is needed to finance acquisition of processing equipment to women and youth. This will reduce drudgery for women and job creation.
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • Processing is mainly done by women and require processing machines. Women do have limited access to funds. Affirmative action is needed to finance acquisition of processing equipment to women and youth. This will reduce drudgery for women and job creation.
Gender related opportunities	<ul style="list-style-type: none"> • Potential for job creation for youth and enhanced food security
VMG issues and concerns in development and dissemination	<ul style="list-style-type: none"> • None
VMG issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> • None.
VMG related opportunities	<ul style="list-style-type: none"> • <i>None</i>
E: Case studies/profiles of success stories	
Success stories from previous similar projects	Product is very popular in Busia Town
Application guidelines for users	<i>Cassava crackies</i> leaflet
F: Status of TIMP readiness (1-ready for upscaling;; 2-requires validation; 3-requires further research)	Ready for upscaling
G: Contacts	Rhoda Nungo c/o Centre Director, KALRO - Alupe, P.O. Box 278-Busia Kenya Email kalro.alupe@ kalro.org
Lead organization and scientists	Rhoda Nungo

Partner organizations	Ministry of Agriculture, Livestock, Fisheries and Irrigation, Farmers
2.5.5 TIMP name	Diversified Cassava Products: Cassava boards, Cassava glue, Cassava Starch, Cassava Sugar/Glucose, Cassava ethanol, Cassava Animal feed
Category (i.e. technology, innovation or management practice)	Technology and Innovation
Problem addressed	High cassava production faced with low demand and consumer uptake
What is it? (TIMP description)	There is need to increase the demand of cassava through diversified product development in-order to increase the uptake of the crop produced hence sustain commercial production of cassava and its certified seed. One way is to diversify the utilization of cassava and thus explore the possibility of produce products such as Cassava boards, Cassava glue, Cassava Starch, Cassava Sugar/Glucose, Cassava ethanol, and Cassava Animal feed
Justification	Diversified use of cassava produce will lead to increased demand for the cassava tubers, which will trigger increased commercial production as increased certified seed demand.
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMPs	❖ Cassava farmers, researchers and extension officers
Approaches to be used in dissemination	❖ Research ❖ Training ❖ Agricultural shows and fairs and exhibitions ❖ Publications
Critical/essential factors for successful promotion	❖ Ability of the farmers to purchase and adoption of the technology by farmers ❖ Availability of funds for fabrication of the technologies and conduct evaluation both on station and on farm demonstration
Partners/stakeholders for scaling up and their roles	❖ Researchers: test, evaluate, train and disseminate ❖ Farmers: adopt ❖ Extension service providers: Participate in TOT and train

C: Current situation and future scaling up	
Counties where already promoted, if any	❖ None
Counties where TIMP will be up scaled	❖ Lamu, Busia, Kisumu
Challenges in dissemination	❖ Weak collaboration among stakeholders involved in agricultural mechanization ❖ Lack of funds for demonstration in the counties
Suggestions for addressing the challenges	❖ Strengthen collaboration between the stakeholders involved ❖ Provision of a reliable source for funding ❖ Package the technology appropriately (manuals, fact sheet, brochure and mobile app)
Social, environmental, policy and market conditions necessary) for development and up scaling	❖ Willingness by stakeholders
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Estimated returns	❖ Increased shelf life by chipping/grating and drying
Gender issues and concerns in development and dissemination	❖ Appropriate package and communication media
Gender issues and concerns in adoption and scaling up	❖ Training to be inclusive men and women in a language that they understand ❖ Training schedule should be sensitive to gender roles and socio-cultural believes of the participants
Gender related opportunities	❖ Enhances food security, income and job creation
Application guidelines for users	❖ Use of training manuals brochures and leaflets
Lead organization and scientists	KALRO-AMRI – Katumani Ms. Susan Maingi, Dr. Benjamin Kivuva, Dr. Noah Wawire
Partner organizations	Farmers, Researchers, Extension providers eg Ministry of Agriculture both at national and county levels, NGOs CBOs, Processors
2.5.6 TIMP name	Cassava Mechanization: Cassava cleaning, Cassava peeler, chipper, graters, driers and millers, and diggers

Category (i.e. technology, innovation or management practice)	❖ Technology and Innovation
Problem addressed	Reduced shelf life, spoilage and food loss, bulkiness and difficult in transportation of cassava roots
What is it? (TIMP description)	There is need to reduce drudgery in post-harvest handling of cassava produce. Thus Designing and fabricating of an improved electric operated chipping machine with a capacity of 300 -350kg per hour, an improved electric operated grating machine, an improved mechanized rotary dryer, Development of a prototype refrigerator for storage, Designing and fabrication of a cassava flour blender and designing and fabrication of a wet milling machine for starch extraction then sedimenting and Sun-drying the starch are some of the cassava processing machines for post harvest value addition and product development require in commercial production of cassava.
Justification	Drying of cassava will increase its shelf life, processing creates varieties of foods with acceptable taste, aroma and texture while starch extraction and drying reduces the cyanide content of cassava and generally these interventions enhance commercialization of cassava and its products.
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMPs	❖ Cassava farmers, researchers and extension officers
Approaches to be used in dissemination	❖ On-farm demonstrations ❖ Training ❖ Agricultural shows and fairs and exhibitions ❖ Publications
Critical/essential factors for successful promotion	❖ Ability of the farmers to purchase and adoption of the technology by farmers ❖ Availability of funds for fabrication of the technologies and conduct evaluation both on station and on farm demonstration
Partners/stakeholders for scaling up and their roles	❖ Researchers: test, evaluate, train and disseminate ❖ Farmers: adopt

	❖ Extension service providers: Participate in TOT and train
C: Current situation and future scaling up	
Counties where already promoted, if any	❖ Makueni, Busia, Machakos
Counties where TIMP will be up scaled	❖ Lamu, Busia, Kisumu
Challenges in dissemination	❖ Weak collaboration among stakeholders involved in agricultural mechanization ❖ Lack of funds for demonstration in the counties
Suggestions for addressing the challenges	❖ Strengthen collaboration between the stakeholders involved ❖ Provision of a reliable source for funding ❖ Package the technology appropriately (manuals, fact sheet, brochure and mobile app)
Social, environmental, policy and market conditions necessary) for development and up scaling	❖ Willingness by stakeholders
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Estimated returns	❖ Increased shelf life by chipping/grating and drying
Gender issues and concerns in development and dissemination	❖ Appropriate package and communication media
Gender issues and concerns in adoption and scaling up	❖ Training to be inclusive men and women in a language that they understand ❖ Training schedule should be sensitive to gender roles and socio-cultural believes of the participants
Gender related opportunities	❖ Enhances food security, income and job creation
Application guidelines for users	❖ Use of training manuals brochures and leaflets
Lead organization and scientists	KALRO-AMRI – Katumani Susan Maingi, Dr. Noah Wawire
Partner organizations	Farmers, Researchers, Extension providers eg Ministry of Agriculture both at national and county levels, NGOs CBOs, Processors

2.6 Marketing of cassava products	
Timps 2.6.1	Identification of existing marketing strategies for cassava produce and products
Category (i.e. technology, innovation or management practice)	❖ Innovation
Problem addressed	Reduced uptake of cassava produce and product due to low or no marketing promotion
What is it? (TIMP description)	To identify the most appropriate strategies for use in up-scaling cassava produce and products
Justification	Promotion of cassava produce and its products will lead to increased uptake by the consumers, hence commercialize cassava production.
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMPs	❖ Cassava farmers, researchers and extension officers
Approaches to be used in dissemination	❖ On-farm demonstrations ❖ Training ❖ Agricultural shows and fairs and exhibitions ❖ Publications
Critical/essential factors for successful promotion	❖ Ability of the farmers to purchase and adoption of the technology by farmers ❖ Availability of funds for fabrication of the technologies and conduct evaluation both on station and on farm demonstration
Partners/stakeholders for scaling up and their roles	❖ Researchers: test, evaluate, train and disseminate ❖ Farmers: adopt ❖ Extension service providers: Participate in TOT and train
C: Current situation and future scaling up	
Counties where already promoted, if any	❖ Makueni, Busia, Machakos
Counties where TIMP will be up scaled	❖ Lamu, Busia, Kisumu
Challenges in dissemination	❖ Weak collaboration among stakeholders involved in agricultural mechanization ❖ Lack of funds for demonstration in the counties

Suggestions for addressing challenges	<ul style="list-style-type: none"> ❖ Strengthen collaboration between the stakeholders involved ❖ Provision of a reliable source for funding ❖ Package the technology appropriately (manuals, fact sheet, brochure and mobile app)
Social, environmental, policy and market conditions necessary) for development and up scaling	<ul style="list-style-type: none"> ❖ Willingness by stakeholders
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Estimated returns	<ul style="list-style-type: none"> ❖ Increased shelf life by chipping/grating and drying
Gender issues and concerns in development and dissemination	<ul style="list-style-type: none"> ❖ Appropriate package and communication media
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> ❖ Training to be inclusive men and women in a language that they understand ❖ Training schedule should be sensitive to gender roles and socio-cultural believes of the participants
Gender related opportunities	<ul style="list-style-type: none"> ❖ Enhances food security, income and job creation
Application guidelines for users	<ul style="list-style-type: none"> ❖ Use of training manuals brochures and leaflets
Lead organization and scientists	KALRO-AMRI – Katumani Mr. Charles Bett
Partner organizations	Farmers, Researchers, Extension providers eg Ministry of Agriculture both at national and county levels, NGOs CBOs, Processors, supermarkets
Timps 2.6.2	Scoping and profiling existing cassava markets commercial villages and innovation platforms for scaling-up
Category (i.e. technology, innovation or management practice)	<ul style="list-style-type: none"> ❖ Innovation
Problem addressed	Reduced uptake of cassava produce and product due to low or no marketing promotion
What is it?	Demand for cassava and its products is key to improved production to meet the supply. To increase demand there is need

(TIMP description)	to identify potential markets for cassava produce and products, which will lead to increased production to meet the demand.
Justification	Promotion of cassava produce and its products will lead to increased uptake by the consumers, hence commercialize cassava production.

B: Assessment of dissemination and scaling up/out approaches

Users of TIMPs	❖ Cassava farmers, researchers and extension officers
Approaches to be used in dissemination	<ul style="list-style-type: none"> ❖ On-farm demonstrations ❖ Training ❖ Agricultural shows and fairs and exhibitions ❖ Publications
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> ❖ Ability of the farmers to purchase and adoption of the technology by farmers ❖ Availability of funds for fabrication of the technologies and conduct evaluation both on station and on farm demonstration
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> ❖ Researchers: test, evaluate, train and disseminate ❖ Farmers: adopt ❖ Extension service providers: Participate in TOT and train

C: Current situation and future scaling up

Counties where already promoted, if any	❖ Makueni, Busia, Machakos
Counties where TIMP will be up scaled	❖ Lamu, Busia, Kisumu
Challenges in dissemination	<ul style="list-style-type: none"> ❖ Weak collaboration among stakeholders involved in agricultural mechanization ❖ Lack of funds for demonstration in the counties
Suggestions for addressing the challenges	<ul style="list-style-type: none"> ❖ Strengthen collaboration between the stakeholders involved ❖ Provision of a reliable source for funding ❖ Package the technology appropriately (manuals, fact sheet, brochure and mobile app)
Social, environmental, policy and market conditions necessary) for development and up scaling	❖ Willingness by stakeholders

D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations

Estimated returns	❖ Increased shelf life by chipping/grating and drying
Gender issues and concerns in development and dissemination	❖ Appropriate package and communication media
Gender issues and concerns in adoption and scaling up	❖ Training to be inclusive men and women in a language that they understand ❖ Training schedule should be sensitive to gender roles and socio-cultural believes of the participants
Gender related opportunities	❖ Enhances food security, income and job creation
Application guidelines for users	❖ Use of training manuals brochures and leaflets
Lead organization and scientists	KALRO-AMRI – Katumani Mr. Charles Bett
Partner organizations	Farmers, Researchers, Extension providers eg Ministry of Agriculture both at national and county levels, NGOs CBOs, Processors, supermarkets
Timps 2.6.3	Prioritization of viable cassava products, Consumer tastes and preferences – consumer analysis
Category (i.e. technology, innovation or management practice)	❖ Innovation
Problem addressed	Reduced uptake of cassava produce and product due to low or no marketing promotion
What is it? (TIMP description)	While there exists many cassava products not all of them maybe ready and viable for commercialization
Justification	Promotion of cassava produce and its products will lead to increased uptake by the consumers, hence commercialize cassava production.
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMPs	❖ Cassava farmers, researchers and extension officers
Approaches to be used in dissemination	❖ On-farm demonstrations ❖ Training

	<ul style="list-style-type: none"> ❖ Agricultural shows and fairs and exhibitions ❖ Publications
Critical/essential factors for successful promotion	<ul style="list-style-type: none"> ❖ Ability of the farmers to purchase and adoption of the technology by farmers ❖ Availability of funds for fabrication of the technologies and conduct evaluation both on station and on farm demonstration
Partners/stakeholders for scaling up and their roles	<ul style="list-style-type: none"> ❖ Researchers: test, evaluate, train and disseminate ❖ Farmers: adopt ❖ Extension service providers: Participate in TOT and train
C: Current situation and future scaling up	
Counties where already promoted, if any	❖ Makueni, Busia, Machakos
Counties where TIMP will be up scaled	❖ Lamu, Busia, Kisumu
Challenges in dissemination	<ul style="list-style-type: none"> ❖ Weak collaboration among stakeholders involved in agricultural mechanization ❖ Lack of funds for demonstration in the counties
Suggestions for addressing the challenges	<ul style="list-style-type: none"> ❖ Strengthen collaboration between the stakeholders involved ❖ Provision of a reliable source for funding ❖ Package the technology appropriately (manuals, fact sheet, brochure and mobile app)
Social, environmental, policy and market conditions necessary) for development and up scaling	❖ Willingness by stakeholders
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Estimated returns	❖ Increased shelf life by chipping/grating and drying
Gender issues and concerns in development and dissemination	❖ Appropriate package and communication media
Gender issues and concerns in adoption and scaling up	<ul style="list-style-type: none"> ❖ Training to be inclusive men and women in a language that they understand ❖ Training schedule should be sensitive to gender roles and socio-cultural believes of the participants
Gender related opportunities	❖ Enhances food security, income and job creation
Application guidelines for users	❖ Use of training manuals brochures and leaflets

Lead organization and scientists	KALRO-AMRI – Katumani Mr. Charles Bett
Partner organizations	Farmers, Researchers, Extension providers eg Ministry of Agriculture both at national and county levels, NGOs CBOs, Processors, supermarkets
Timps 2.6.4	Business plans, Registration, branding and advertising
Category (i.e. technology, innovation or management practice)	❖ Innovation
Problem addressed	Reduced uptake of cassava produce and product due to low or no marketing promotion
What is it? (TIMP description)	The consumer preferred identified products will form a basis for developing business plans by commercial villages. The commercial villages or innovation platforms will chose the products that have a comparative advantage and then register, brand and promote them.
Justification	Promotion of cassava produce and its products will lead to increased uptake by the consumers, hence commercialize cassava production.
B: Assessment of dissemination and scaling up/out approaches	
Users of TIMPs	❖ Cassava farmers, researchers and extension officers
Approaches to be used in dissemination	❖ On-farm demonstrations ❖ Training ❖ Agricultural shows and fairs and exhibitions ❖ Publications
Critical/essential factors for successful promotion	❖ Ability of the farmers to purchase and adoption of the technology by farmers ❖ Availability of funds for fabrication of the technologies and conduct evaluation both on station and on farm demonstration
Partners/stakeholders for scaling up and their roles	❖ Researchers: test, evaluate, train and disseminate ❖ Farmers: adopt ❖ Extension service providers: Participate in TOT and train
C: Current situation and future scaling up	
Counties where already promoted, if any	❖ Makueni, Busia, Machakos

Counties where TIMP will be up scaled	❖ Lamu, Busia, Kisumu
Challenges in dissemination	❖ Weak collaboration among stakeholders involved in agricultural mechanization ❖ Lack of funds for demonstration in the counties
Suggestions for addressing the challenges	❖ Strengthen collaboration between the stakeholders involved ❖ Provision of a reliable source for funding ❖ Package the technology appropriately (manuals, fact sheet, brochure and mobile app)
Social, environmental, policy and market conditions necessary) for development and up scaling	❖ Willingness by stakeholders
D: Economic, gender, vulnerable and marginalized groups (VMGs) considerations	
Estimated returns	❖ Increased shelf life by chipping/grating and drying
Gender issues and concerns in development and dissemination	❖ Appropriate package and communication media
Gender issues and concerns in adoption and scaling up	❖ Training to be inclusive men and women in a language that they understand ❖ Training schedule should be sensitive to gender roles and socio-cultural believes of the participants
Gender related opportunities	❖ Enhances food security, income and job creation
Application guidelines for users	❖ Use of training manuals brochures and leaflets
Lead organization and scientists	KALRO-AMRI – Katumani Mr. Charles Bett
Partner organizations	Farmers, Researchers, Extension providers e.g. Ministry of Agriculture both at national and county levels, NGOs CBOs, Processors, supermarkets

GAPS

Research cassava flour blending with other cereal flours for nutrition and value addition