

Value chain development for mango (*Mangifera indica*) around Outamba Kilimi National Park in Sierra Leone: constraints and opportunities for smallholders

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Table 2. Constraints, coping strategies and opportunities for mango nursery supply

Villages	Constraints (ranked from 1 st to 4 th)	Coping strategies	Opportunities
Samaya	<ul style="list-style-type: none"> - Lack of input especially polythene bags and improved mango planting material - Water source far from the nursery sites - High occurrence of wild fire - High infestation of seeds by pest during germination 	<ul style="list-style-type: none"> - Nursing of planting material done on ridges and sometimes use of drinking water packing plastics; use of local varieties - Water was sourced from a site located at 3 km from the nursery site - Construction of fire belt - No strategy developed 	<ul style="list-style-type: none"> - Land fertile and available for mango production - Hired labour available
Fintonia	<ul style="list-style-type: none"> - Idem (compared to Samaya) - High infestation of seeds by pest and disease during germination - Lack of technical knowledge on nursery production 	<ul style="list-style-type: none"> - Idem (compared to Samaya) - No strategy developed - Seek advices from colleagues farmers 	<ul style="list-style-type: none"> - Idem (compared to Samaya) - Availability of nursery producers in the community - High intervention of ICRAF in the village -Hired labour available
Sanya	<ul style="list-style-type: none"> - Water shortage during the dry season - Lack of input especially polythene bags and improved mango planting material - High occurrence of wild fire - Idem (compared to Samaya) 	<ul style="list-style-type: none"> - Fetch water far from the nursery site - Nursing of planting material done on ridges and sometimes use of drinking water packing plastics; use of local varieties - Construction of fire belt - Idem (compared to Samaya) 	<ul style="list-style-type: none"> - High intervention by STEWARD, ICRAF and LAMIL through sensitization - Land fertile and available for mango production
Kabba Ferry	<ul style="list-style-type: none"> - Idem (compared to Samaya) - Lack of appropriate tools - High infestation of seeds by pest during germination -Lack of technical knowledge on nursery production 	<ul style="list-style-type: none"> - Idem (compared to Samaya) - Use of available tools - No strategy developed -Use of existing knowledge 	<ul style="list-style-type: none"> - High availability of local varieties - Availability of tools manufacturers around the community. -Presence of technical partners like ICRAF and others

Table 3. Constraints, coping strategies and opportunities for mango producers

Villages	Constraints (ranked from 1 st to 4 th)	Coping strategies	Opportunities
Samaya	- Lack of herbicide	- Hand weeding	
	- High occurrence of wild fire	- Construction of fire belt/ brushing and clearing done around plantation sites	- Availability of hired labour
	- Limited access to grafting techniques	-Use existing knowledge	- High intervention of ICRAF and STEWARD
Fintonia	- Lack of mineral fertiliser	- Use of available organic fertiliser	- Availability of organic fertilizers
	- Idem (compared to Samaya)	- Brushing and clearing around plantation sites	- Availability of hired labour
	- High infestation by pest and disease	- No strategy developed	
	- Shortage of water during dry season	- Fetch water from another place far from the plantation site	-Availability of hired labour
Sanya	- Shortage of water during the dry season	- Fetch water from another place far from the plantation site	- Available of hired labour production
	- Lack of mineral fertiliser	- Use of organic fertiliser	- Availability of organic fertilizers
	- Idem (compared to Fintonia)	- No strategy developed	
	- Limited access to improved varieties	- Use of local and existing improved varieties	- Availability of local varieties
Kabba Ferry	- Limited access to improve agronomic practices in mango production	- Use of existing agronomic techniques	- Availability of existing techniques in mango production
	- Shortage of water during dry season	- Fetch water from another place far from the plantation site	- Availability of water source and hired labour
	- High occurrence of wild fire	- Construction of fire belt or cleaning and clearing around plantations	- Availability of hired labour
	- Lack of herbicides	-Hand weeding	

Table 4. Constraints, coping strategies and opportunities for mango harvesters

Villages	Constraints (ranked from 1 st to 4 th)	Strategies developed	Opportunities
Samaya	<ul style="list-style-type: none">- Lack of harvesting nets- Harvesting done with pole which is time consuming activity- Local varieties difficult to harvest due to the higher height of the tree when fruits are physiologically matured	<ul style="list-style-type: none">- Use of available material- No strategy developed- No strategy developed	Availability of local harvesting materials
Fintonia	<ul style="list-style-type: none">- Limited access to improved harvesting techniques- Idem (compared to Samaya)- Current harvesting techniques risky- Frequent ants bite during fruit harvesting	<ul style="list-style-type: none">- Use of traditional techniques- Idem (compared to Samaya)- No strategy developed- No strategy developed	Intervention of ICRAF STEWARD' and LAMIL in the community
Sanya	<ul style="list-style-type: none">- Idem (compared to Fintonia)- Frequent ants bite during fruit harvesting- Idem (compared to Samaya)	<ul style="list-style-type: none">- Idem (compared to Fintonia)- No strategy developed- Idem (compared to Samaya)	Presence of ICRAF, and STEWARD
Kabba Ferry	<ul style="list-style-type: none">- Lack of improved harvesting techniques- Frequent ants bite during fruit harvesting- Harvesting done with pole which is time consuming activity- Idem (compared to Samaya)	<ul style="list-style-type: none">- Use of traditional techniques- No strategy developed- No strategy developed- Idem (compared to Samaya)	-Availability of harvesters

Table 5. Constraints, coping strategies and opportunities for mango processors

Villages	Constraints (ranked from 1 st to 4 th)	Strategies developed	Opportunities
Samaya	-Limited access to improved or modern processing equipment	-Use of fishing net and plastic sheets to dry boiled sliced mango	-Availability of local processing techniques
	-Mango processing done at household level and no improved processing methods used	-No strategy developed	-Availability of processors
	-Processing done manually	-No strategy developed	
	-High proportion of infested mango by pest and disease	-Infested mangoes not processed	
Fintonia	-Injury caused during fruit processing	-Wrap hands with a piece of cloth to avoid further injury	-Availability of local varieties
	-Limited access to modern processing equipment	-Borrow local processing equipment from other processors who own the local processing equipment	-Willingness of processors to increase the volume of processed product
	-Low volume of processed mango	-No strategy developed	
	- Idem (compared to Samaya)	- Idem (compared to Samaya)	
	- No markets for processed products	- No strategy developed	
Sanya	- Idem (compared to Samaya)	-Processing done with the use of local processing equipment	-Availability of local varieties that can be processed
	-Lack of drying equipment	-Use of mats and bags, fishing nets etc to dry the products	-Willingness of processors to increase the volume of processed product
	-Processing done manually	-No strategy developed	
Kabba Ferry	-Injury caused during fruit processing due to the local and manual processing methods	-No strategy developed	-Willingness of processors to increase the volume of processed product
	-Limited local processing equipment	-Borrow equipment from other processors who own local processing equipment	
	-Processing activity is labour-intensive	- No strategy developed	
	-Limited access to modern processing equipment	No strategy developed	

Table 6. Constraints, coping strategies and opportunities for mango traders

Villages	Constraints (ranked from 1 st to 4 th)	Strategies developed	Opportunities
Samaya	-High transportation cost	-Product sold at the farm gate when traders are producer or very close	-Willingness of producers to increase mango production
	-Poor road network	-Product sold at the nearest market	-Availability of Thambie periodic market
	-Lack of storage facilities in the markets	-Processing of local products	
	-Less mango customers	-No strategy developed	
Fintonia	-Lack of market structure in the community.	-Product sold at the farm gate	-Availability of the improved mango varieties
	-High transportation cost	- Product sold in the community	
	-Low prices for processed mango	- No strategy developed	-Availability of local variety as it is the only variety that can be processed.
Sanya	Mango fruits not sold in that locality	non applicable	non applicable
Kabba Ferry	-Lack of market structure in the community	-Use of motor bikes to take products to the nearest market	Availability of and transporters
	-High transportation cost	-Product sold at all cost	
	-Lack of training on modern marketing techniques	-Use traditional marketing techniques	
	-Poor road network	-No strategy developed	