

Project component	Outputs	Activity	Total budget	Year 1	Year 2	Year 3	Year 4	Notes
1. Preparation, implementation and sustainable management of priority sub-projects at the city level	Output 1.1. Sub-projects implementation plans fully developed with communities and municipalities, including detailed engineering studies	1.1.1. Design of detailed sub-project documents, incl. technical specifications, roles and budgets	\$396,000	\$396,000	\$0	\$0	\$0	A
	Output 1.2. Priority sub-projects are implemented in the four target cities mainly through community involvement as labour-intensive manpower	1.2.1. Implementation of 23 priority sub-projects in the 4 targeted cities	\$7,749,999	\$1,500,000	\$2,200,000	\$2,200,000	\$1,849,999	B
	Output 1.3. Municipal staff and community members mobilised, trained and equipped for ensuring the sustainable management and/or maintenance of the implemented priority sub-projects	1.3.1. Organisation of trainings for municipal staff and community members on the sustainable management and maintenance of the realised physical interventions	\$2,345,600	\$586,400	\$586,400	\$586,400	\$586,400	C
	Project component total		\$10,491,599	\$2,482,400	\$2,786,400	\$2,786,400	\$2,436,399	
2. Tools and guidelines development and training delivery at the national level	Output 2.1 National tools, guidelines, policies and/or legislation for promoting urban climate adaptation developed	2.1.1. Development of national tools, guidelines, policies and/or legislation for promoting urban climate change adaptation	\$270,000	\$40,000	\$80,000	\$80,000	\$70,000	F
	Output 2.2. National and local officers trained in urban climate adaptation techniques and approaches	2.2.1. Organisation of trainings of national and local officers to respond to, and mitigate impacts of climate-related events on urban areas	\$490,000	\$80,000	\$160,000	\$160,000	\$90,000	G
	Project component total		\$760,000	\$120,000	\$240,000	\$240,000	\$160,000	
3. Inter-country experience sharing, cross-fertilisation and dissemination of lessons learned at the regional level	Output 3.1. Lessons learned and best practices captured and disseminated through the SADC DRR Unit in partnership with DiMSUR as regional knowledge management platform	3.1.1.Compilation and dissemination of lessons learned and best practices online (i.e. through knowledge hub)	\$170,000	\$0	\$50,000	\$70,000	\$50,000	H
	Output 3.2. Cross-fertilisation activities among the participating countries are discussed and prepared	3.2.1. Organisation of cross-country advisory and learning missions (by municipalities, ministries and/or communities)	\$120,000	\$0	\$40,000	\$40,000	\$40,000	I
	Output 3.3. Regional workshops for experience sharing among the different countries, and participation to global events	3.3.1. Organisation of annual regional workshops for experience sharing, and participation to global events	\$240,000	\$60,000	\$60,000	\$60,000	\$60,000	J
	Project component total		\$530,000	\$60,000	\$150,000	\$170,000	\$150,000	
Sub-Total Project Activities			\$11,781,599	\$2,662,400	\$3,176,400	\$3,196,400	\$2,746,399	
Project Execution Costs (9.5%)		Project Manager (P3 level / 75% staff time)	\$400,000	\$100,000	\$100,000	\$100,000	\$100,000	K
		National Project Managers (NPMs)	\$620,000	\$155,000	\$155,000	\$155,000	\$155,000	
		Travel for project execution purposes (PM and so on)	\$40,000	\$10,000	\$10,000	\$10,000	\$10,000	
		Mid term evaluation	\$15,000	\$0	\$15,000	\$0	\$0	
		Final Evaluation of the project	\$15,000	\$0	\$0	\$0	\$15,000	
		Misc/operational/other costs for NPMs	\$29,252	\$7,313	\$7,313	\$7,313	\$7,313	
Sub-Total Project Execution			\$1,119,252	\$272,313	\$287,313	\$272,313	\$287,313	
Total Project Costs			\$12,900,851	\$2,934,713	\$3,463,713	\$3,468,713	\$3,033,712	
Project Cycle Management (8.5%)		Senior Human Settlements Officer (P5 level / 5% staff time)	\$40,000	\$10,000	\$10,000	\$10,000	\$10,000	L
		Project Assistant and KM expert (NO-B level / 50% staff time)	\$132,000	\$33,000	\$33,000	\$33,000	\$33,000	
		Travel for monitoring/oversight missions	\$21,512	\$5,378	\$5,378	\$5,378	\$5,378	
		Project Support Costs = 7% of Total Project Costs	\$903,060	\$205,430	\$242,460	\$242,810	\$212,360	
Project cycle management total			\$1,096,572	\$253,808	\$290,838	\$291,188	\$260,738	
Amount of Financing Requested			\$13,997,423	\$3,188,521	\$3,754,551	\$3,759,901	\$3,294,450	

Item/ Note	Budget description and related outputs	Description of expenditure	Countries	Number per country	Quantity / months per country	US\$ per quantity / month	Total US\$
A	Contractual services, workshops, materials & goods and travel  Output 1.1. Sub-projects implementation plans fully developed with communities and municipalities, including detailed engineering studies	Lead developer of detailed sub-project documents	4.00	1.00	3.00	\$ 5,500.00	\$ 66,000.00
		Experts (engineers, architects, etc.) to provide technical inputs and carry out engineering studies to complete sub-project documents	4.00	3.00	3.00	\$ 4,500.00	\$ 162,000.00
		Lead organizer community consultations	4.00	1.00	3.00	\$ 3,000.00	\$ 36,000.00
		City/community consultation and analysis assistance	4.00	2.00	3.00	\$ 2,500.00	\$ 60,000.00
		City/community workshops	4.00	2.00	1.00	\$ 2,500.00	\$ 20,000.00
		Communication (data for tablets, GIS, etc.)	4.00	1.00	1.00	\$ 1,000.00	\$ 4,000.00
		Laptops/tablets, printer	4.00	2.00	1.00	\$ 2,000.00	\$ 16,000.00
		Transport (travel / der diem also for consultations)	4.00	4.00	1.00	\$ 2,000.00	\$ 32,000.00
		Total					\$ 396,000.00
B	Contractual services for the implementation of priority sub-projects  Output 1.2. Priority sub-projects are implemented in the four target cities mainly through community involvement as labour-intensive manpower	Implementation of priority sub-projects - see detailed budget in separate sheet (Expected Output 1.2)					\$ 7,749,999.00
C	Contractual services, workshops, materials & goods and travel  Output 1.3. Municipal staff and community members mobilised, trained and equipped for ensuring the sustainable management and/or maintenance of the implemented priority sub-projects	Lead organizer/developer trainings	4.00	1.00	48.00	\$ 4,500.00	\$ 864,000.00
		Trainings assistance + technical inputs	4.00	2.00	24.00	\$ 3,000.00	\$ 576,000.00
		Municipality/community mobilizer / technical expert	4.00	1.00	48.00	\$ 2,300.00	\$ 441,600.00
		Trainings and materials city-level	4.00	4.00	1.00	\$ 4,000.00	\$ 64,000.00
		Trainings and materials community level	4.00	8.00	1.00	\$ 2,500.00	\$ 80,000.00
		Transport (travel / der diem)	4.00	40.00	1.00	\$ 2,000.00	\$ 320,000.00
		Total					\$ 2,345,600.00
		Sub-Total Project Outcome 1					\$ 10,491,599.00
F	Contractual services, workshops, materials & goods and travel  Output 2.1 National tools, guidelines, policies and/or legislation for promoting urban climate adaptation developed	Lead writer guidelines/policies/legislation	4.00	2.00	4.00	\$ 3,000.00	\$ 96,000.00
		Technical expert to provide inputs guidelines/strategies/plans/tools	4.00	2.00	4.00	\$ 2,000.00	\$ 64,000.00
		Workshops, Production and dissemination	4.00	4.00	1.00	\$ 5,000.00	\$ 80,000.00
		Transport (travel / der diem)	4.00	4.00	1.00	\$ 1,875.00	\$ 30,000.00
		Total					\$ 270,000.00
G	Contractual services, workshops, materials & goods and travel  Output 2.2. National and local officers trained in urban climate adaptation techniques and approaches	Lead organizer/developer trainings	4.00	1.00	12.00	\$ 3,000.00	\$ 144,000.00
		Technical expert to provide inputs to trainings	4.00	1.00	12.00	\$ 2,000.00	\$ 96,000.00
		Trainings, workshops and materials	4.00	4.00	1.00	\$ 10,000.00	\$ 160,000.00
		production and dissemination	4.00	1.00	1.00	\$ 6,500.00	\$ 26,000.00
		Transport (travel / der diem)	4.00	4.00	1.00	\$ 4,000.00	\$ 64,000.00
		Total					\$ 490,000.00
		Sub-Total Project Outcome 2					\$ 760,000.00
H	Contractual services, workshops, materials & goods and travel  Output 3.1. Lessons learned and best practices captured and disseminated through the SADC DRR Unit in partnership with DIMSUR as regional knowledge management platform	Consultants for drafting the best practices		4.00	2.00	\$ 5,000.00	\$ 40,000.00
		Drafting of regional guidelines and training materials		1.00	10.00	\$ 4,000.00	\$ 40,000.00
		Senior trainers		2.00	5.00	\$ 6,000.00	\$ 30,000.00
		Training workshops	4.00	1.00	1.00	\$ 10,000.00	\$ 40,000.00
		Transport (travel / der diem)		8.00		\$ 2,500.00	\$ 20,000.00
		Total					\$ 170,000.00
I	Contractual services, workshops, materials & goods and travel  Output 3.2. Cross-fertilisation activities among the participating countries are discussed and prepared	Technical peer reviewers	4.00	1.00	2.00	\$ 5,000.00	\$ 40,000.00
		Technical expert for project design and resource mobilisation	4.00	1.00	2.00	\$ 5,000.00	\$ 40,000.00
		Cross-country advisory and learning exchange missions (by municipalities/ministries/comunities)	4.00	1.00	1.00	\$ 10,000.00	\$ 40,000.00
		Total					\$ 120,000.00
J	Output 3.3. Regional workshops for experience sharing among the different countries, and participation to global events	Regional workshops (including travel costs of participants)	4.00	1.00	1.00	\$ 50,000.00	\$ 200,000.00
		Participation to international/global events	4.00	1.00	1.00	\$ 10,000.00	\$ 40,000.00
		Total					\$ 240,000.00
		Sub-Total Project Outcome 3					\$ 530,000.00
		Sub-Total Project Activities					\$ 11,781,599.00
K	Project Execution Costs (9.5%)	Project Manager (P3 level / 75% staff time)	1.00	1.00	48.00	\$ 8,333.33	\$ 400,000.00
		National Project Managers (NPMs)	4.00	1.00	48.00	\$ 3,229.17	\$ 620,000.00
		Travel for project execution purposes (PM and so on)	4.00	1.00	1.00	\$ 10,000.00	\$ 40,000.00
		Mid term evaluation	1.00	1.00	1.00	\$ 15,000.00	\$ 15,000.00
		Final Evaluation of the project	1.00	1.00	1.00	\$ 15,000.00	\$ 15,000.00
		Misc/operational/other costs for NPMs	4.00	1.00	1.00	\$ 7,313.00	\$ 29,252.00
		Sub-Total Execution Costs					\$ 1,119,252.00
		Total Project Costs					\$ 12,900,851.00
L	Project Cycle management (8.5%)	Senior Human Settlements Officer (P5 level / 5% staff time)	1.00	1.00	48.00	\$ 833.33	\$ 40,000.00
		Project Assistant and KM expert (NO-B level / 50% staff time)	1.00	1.00	48.00	\$ 2,750.00	\$ 132,000.00
		Travel for monitoring/oversight missions	4.00	1.00	1.00	\$ 5,378.00	\$ 21,512.00
		Project Support Costs = 7% of Total Project Costs					\$ 903,060.00
		Sub-Total Project Cycle Management					\$ 1,096,572.00
		Amount of Financing Requested					\$ 13,997,423.00

City/Country	Sub-Project	BL	Detailed Activity	Unit	Nr. of Units	Avg. Unit Cost in USD (all included)	Total Cost in USD
Morondova, Madagascar	5.1.1. Rehabilitation of 180 ha of mangroves	1	Hiring a local sub-contractor/NGO to prepare the tree nurseries, recruit and train local labour and plant/maintain the mangroves (see detailed costs in separate file)	lumpsum			388,000
		2	On-site technical assistance for community mobilisation, gender mainstreaming and planting techniques	per month	36	2,000	72,000
		3	Preparation of awareness raising and training materials and dissemination	lumpsum			10,000
		4	Training and awareness raising activities on mangrove planting and conservation	per session	12	2,000	24,000
		5	Purchase of equipment for mangrove planting and maintenance (truck, drone, tools, etc.)	lumpsum			50,000
		6	Operational costs, communication, sundries	per month	36	444	16,000
	Total Costs of Sub-Project 5.1.1						560,000
	5.1.2. Urban greening interventions in high risk areas	7	On site technical assistance, urban design, monitoring and supervision	per month	5	4,000	20,000
		8	Hiring a local sub-contractor/NGO to hire local labour, purchase the plants and construct the public space (see detailed costs in separate file)	lumpsum			100,000
	Total Costs of Sub-Project 5.1.2						120,000
	5.1.3. Establishment of a city-wide early warning system for floods	9	Technical studies and assessments	lumpsum			15,000
		10	Cost of materials and equipment of the centre of surveillance	lumpsum			20,000
		11	Training and capacity building	lumpsum			10,000
		12	Installation of the raingauging stations and sirenes	lumpsum			40,000
	Total Costs of Sub-Project 5.1.3						85,000
	5.1.4. Construction of a resilient and multi-purpose safe-haven	13	On site technical assistance, building design, monitoring and supervision	per month	5	4,000	20,000
		14	Safe-Haven construction costs (see detailed costs in separate file)	lumpsum			181,000
		Total Costs of Sub-Project 5.1.4					
	5.1.5. Construction of a flood-proof elevated road with improved drainage capacity	15	On site technical assistance, road design, monitoring and supervision	per month	5	4,000	20,000
		16	Road construction costs (see detailed costs in separate file)	lumpsum			405,000
		Total Costs of Sub-Project 5.1.5					
	5.1.6. Reconstruction of 3 bridges connecting different neighbourhoods in a resilient manner	17	On site technical assistance, bridge design, monitoring and supervision	per month	5	4,000	20,000
		18	Bridges construction costs (see detailed costs in separate file)	lumpsum			230,000
		Total Costs of Sub-Project 5.1.6					
	5.1.7. Enhancing the drainage capacity in the city centre	19	On site technical assistance, drainage design, monitoring and supervision	per month	5	4,000	20,000
		20	Drainage construction costs (see detailed costs in separate file)	lumpsum			110,000
		21	Rehabilitation and cleaning of 4,389m of drainage channels through labour-intensive activities	per 100 m	40	1,000	40,000
		Total Costs of Sub-Project 5.1.7					
	5.1.8. Improving solid waste management in the city centre	22	On site technical assistance of waste management specialist, monitoring and supervision	per month	5	4,000	20,000
		23	Hiring of a local NGO to set up the community-based SWM mechanisms, purchase equipment, train community members, etc.	lumpsum			100,000
		24	Purchase of a waste transport truck	per unit	1	60,000	60,000
		25	Operational costs (fuel, etc.)	lump sum			10,000
		Total Costs of Sub-Project 5.1.8					
	Sub-Total Morondava						2,001,000
	5.2.1. Establishment of a city-wide early warning system for floods	26	Provision of technical assistance for setting up the early warning system (EWS) in Zomba, including assessments, design, training and supervision	per month	7	5,000	35,000
		27	Modernise/rehabilitate 2 weather stations including materials upgrade and automated measuring system	per unit	2	15,000	30,000
		28	Installation of 3 automated water gauges and sirens	per unit	3	15,000	45,000
		29	Training and awareness raising of surrounding communities	per community	3	5,000	15,000
		30	Training of EWS operators	lumpsum			10,000
		31	purchase of equipment (mobile phones for EWS operators, etc.)	lumpsum			5,000
	Total Costs of Sub-Project 5.2.1						140,000
	5.2.2. Construction of multi-purpose evacuation centres	32	On site technical assistance for building design, works supervsion, etc.	per site	3	7,500	22,500
		33	Accommodation blocks (2 rooms per block) – 2 blocks per site	per block	6	25,000	150,000
		34	General purpose room (admin, clinic etc) – 1 per site	per site	3	3,000	9,000
		35	Toilet blocks (2 per site)	per block	6	7,000	42,000
		36	Kitchen (1 per site)	per site	3	4,000	12,000
		37	Rehabilitation and signalling of 3 evacuation routes	per route	3	6,000	18,000
		38	Training and capacity building	lumpsum			9,500
		39	purchase of equipment (bicycle ambulances, etc.)	per site	3	4000	12,000
	Total Costs of Sub-Project 5.2.2						275,000

Zomba, Malawi	5.2.3. Rehabilitation of existing drainage channels and construction of new drainage channels	40	On site technical assistance for drainage design, works supervision, etc.	per ward	4	10,000	40,000
		41	Drainage works in Sadzi ward - 1,655 m (see detailed costs in separate file)	lumpsum			83,000
		42	Drainage works in Chinamwali ward - 1,400 m (see detailed costs in separate file)	lumpsum			66,000
		43	Drainage works in Mtyia ward - 450 m (see detailed costs in separate file)	lumpsum			32,000
		44	Drainage works in Masongola ward - 1,970 m (see detailed costs in separate file)	lumpsum			92,000
		Total Costs of Sub-Project 5.2.3					313,000
	5.2.4. Improving solid waste management	45	Technical assistance to the city council and to the communities (policy formulation, training, marketing, etc.)	lumpsum			20,000
		46	Construction of community waste management centres - composting	per centre	4	11,000	44,000
		47	Construction of community waste management centres - paved surface	per centre	4	3,000	12,000
		48	Construction of community waste management centres - washroom	per centre	4	450	1,800
		49	Construction of community waste management centres - office	per centre	4	400	1,600
		50	Construction of community waste management centres - perimeter fencing	per centre	4	5,000	20,000
		51	Equipment (protective clothing, hand carts, wheelbarrows, shovels, rakes, etc.)	per centre	4	1,825	7,300
		52	Waste collection vehicle for municipal use - tractor with trailer	per unit	1	28,000	28,000
		53	Training of community groups and awareness raising	per ward	4	10,000	40,000
		54	Communication, advocacy, marketing, etc.	lumpsum			10,000
	Total Costs of Sub-Project 5.2.4					184,700	
	5.2.5. River-focused interventions to prevent erosion and flooding	55	On site technical assistance for design, engineering calculations, supervision, etc.	lumpsum			40,000
		56	Purchase of gabions (1 m x 1 m x 2 m)	per unit	2,000	150	300,000
		57	Recruitment of local workers	lumpsum			40,000
		58	Training and awareness raising	lumpsum			20,000
		59	Transport, logistics, hiring of machinery and other operational costs	lumpsum			50,000
	Total Costs of Sub-Project 5.2.5					450,000	
	5.2.6. Construction and rehabilitation of bridges and dams on Likangala River	60	On site technical assistance, bridge design, monitoring and supervision	lumpsum			20,000
		61	Two Million Bridge construction costs (see detailed costs in separate file)	lumpsum			87,000
		62	Likangala Bridge rehabilitation costs	lumpsum			15,000
		63	Mpondabwino Bridge rehabilitation costs	lumpsum			10,000
		64	Rehabilitation of two dams in the Likangala River	per dam	2	14,000	28,000
		Total Costs of Sub-Project 5.2.6					160,000
	5.2.7. Sustainable urban forest management	65	On site technical assistance	per ward	7	5,000	35,000
		66	Establishment of 14 tree nurseries (2 per ward), incl. equipment (water canes, polythene tubes, wheel barrows), seeds, manure and labour	per nursery	14	15,000	210,000
		67	Tree planting incl. labour (clearing, planting, weeding) - approx 290,000 seedlings to cover 225 hectares	per 1,000 seedlings	290	300	87,000
		68	Training of community groups to manage the nurseries and planting	per ward	7	2,571	18,000
		Total Costs of Sub-Project 5.2.7					350,000
	Sub-Total Zomba					1,872,700	
Chokwe, Mozambique	5.3.1. Improving the overall drainage capacity of the city	69	On site technical assistance, drainage design, monitoring and supervision	lump sum			100,000
		70	Drainage construction/rehabilitation costs (see detailed costs in separate file)	lumpsum			900,000
	Total Costs of Sub-Project 5.3.1					1,000,000	
	5.3.2. Construction of safe-havens	71	On site technical assistance, building design, monitoring and supervision	per safe haven	2	20,000	40,000
		72	Safe-haven construction costs (see detailed costs per building in separate file)	per building	2	80,000	160,000
	Total Costs of Sub-Project 5.3.2					200,000	
	5.3.3. Improving solid waste management	73	Technical assistance for building design, training of and support to community groups, supervision, etc	per neighbourhood	3	20,000	60,000
		74	Construction of community waste management centres	per centre	3	50,000	150,000
		75	Equipment (pallet stacker, bulk bags, waste bins, trolleys, etc.)	per centre	3	8,333	25,000
		76	Training and awareness raising	per neighbourhood	3	10,000	30,000
		Total Costs of Sub-Project 5.3.3					265,000
	5.3.4. Enhancing early warning for floods at community level	77	On site technical assistance for assessments, strategy formulation and training	lumpsum			15,000
		78	Marking and signaling escape routes, safe havens and areas at risk	per neighbourhood	7	2,000	14,000
		79	Purchase of equipment (megaphones, radio, mobiles, etc.)	per neighbourhood	7	4,000	28,000
		80	Institutional coordination/capacity development	lumpsum			8,000

		81	Training and awareness raising at community level, incl. emergency drills, theatre, debates, etc.	per neighbourhood	7	5,000	35,000	
			Total Costs of Sub-Project 5.3.4				100,000	
			Sub-Total Chokwe				1,565,000	
Moroni, Comoros	5.4.1. Reinforcing the drainage capacity in La Coulée neighbourhood	82	On site technical assistance, drainage design, monitoring and supervision	lumpsum			100,000	
		83	Topsoil excavation for drainage ditches and conveyance system	per metre	1,245	120	149,400	
		84	Rock excavation for drainage ditches and conveyance system	per metre	1,545	290	448,050	
		85	Constuction of concrete ditches	per metre	905	480	434,400	
		86	Pipe connections	per metre	87	120	10,440	
		87	Outlet structure	per cubic metre	12	480	5,760	
		88	Digging and preparing the Dog detention pond	per cubic metre	10,510	75	788,250	
				Total Costs of Sub-Project 5.4.1				1,936,300
	5.4.2. Establishment of community-managed rainwater harvesting systems in La Coulée neighbourhood	89	On site technical assistance, design, suprevision, etc.	lumpsum			20,000	
		90	Construction of of 4 ferro-cement water tanks of 10 m³	per tank	4	4,000	16,000	
		91	Installation of metallic roofing in the community-managed rainwater harvesting systems	per m²	455	62	28,000	
		92	Construction of of 4 ferro-cement water tanks of 5 m³	per tank	50	2,000	100,000	
		93	installation of pipes and gutters	per unit	60	100	6,000	
				Total Costs of Sub-Project 5.4.2				170,000
	5.4.3. Improving solid waste management in La Coulée and Médina neighbourhoods	94	On site technical assistance, strategy design, training and community support	lumpsum			20,000	
		95	Purchase of waste containers of 360 litres volume	per unit	30	1,000	30,000	
		96	Purchase of other equipment	per neighbourhood	2	5,000	10,000	
		97	Preparation of awareness raising and advocacy materials	lumpsum			10,000	
		98	Awareness raising campaigns	per neighbourhood	2	10,000	20,000	
		99	Training and capacity building	per neighbourhood	2	15,000	30,000	
					Total Costs of Sub-Project 5.4.3			
	5.4.4. Setting up a flood early warning system in La Coulée neighbourhood	100	Specialised technical assistance (studies, training, etc.)	lumpsum			15,000	
		101	Construction of river water gauges	per unit	2	7,500	15,000	
		102	Construction of automated weather stations	per unit	2	15,000	30,000	
		103	Purchase and installation of equipment	lumpsum			15,000	
104		Training and capacity building of system operators	lumpsum			10,000		
			Total Costs of Sub-Project 5.4.4				85,000	
			Sub-Total Moroni				2,311,300	
			Total Expected Output 1.2				7,749,999	

<b>Provision en équipements de travail</b>	<b>Unité</b>	<b>Qté</b>	<b>pu Ar</b>
<b>Travaux communautaires (HIMO)</b>			
Récolte et triage des propagules : 150 pers x 10 x 4 Mois	Individu	6,000	5,000
Préparation, délimitation de la zone et plantation des propagules : 150 pers x 10 x 4 Mois	Individu	6,000	5,000
Superviseurs: 15 pers x 10 x 4 Mois	Individu	600	15,000
Achats - transport des propagules : 1000Ar X 300 000 propagules /an	unité	300,000	1,000
Entretien : 300 pers X 10 jours X 5000 Ar	Individu	3,000	5,000
<b>Total provision d'équipements</b>			

<b>Frais de gestion et achats de materiel de suivi</b>	<b>Unité</b>	<b>Qté</b>	<b>PU Ar</b>
Frais de gestion des activités (4%)	fft	4	20,000,000
Achat Drone	Unité	1	5,000,000
<i>sous total 2</i>			
<b>TOTAL GENERAL</b>			

Montant Total première année	Montant Total deuxième année	Montant Total troisième année	TOTAL
30,000,000	30,000,000	30,000,000	
30,000,000	30,000,000	30,000,000	
9,000,000	9,000,000	9,000,000	
300,000,000	300,000,000	300,000,000	
15,000,000	15,000,000	15,000,000	
384,000,000	384,000,000	384,000,000	1,152,000,000
Montant Total			
20,000,000	20,000,000	20,000,000	
5,000,000			
25,000,000	20,000,000	20,000,000	
409,000,000	404,000,000	404,000,000	1,217,000,000
			388,198

N°	Sur deux (02) sites	Unite
1	Protection de la digue sur 100m avec végétalisation sur les accotement et implantation de bancs publics et poteaux solaires	fft
Protection et végétalisation des accotements		
2	Plantation arbustre tous les 10m (Achats + Délimitation + trouaison + - Plantation et rebouchage)	unité
3	Protection au sol de la plante par des maçonnerie en beton	unité
Aménagement de la plateforme		
4	Construction de banc public	unité
	Achat et constructions des mobiliers urbains (pergola, jardin,	fft
5	Construction d'un air de jeux pour enfant (Toboggan, balançoire, trampoline, jeux d'escalade.. )	fft
	Renforcement de la digue de protection par enrochement	fft
7	Construction de deux blocs sanitaire (Urinoire et 3 WC homme + 3 WC femmes + 2 laves mains)	unité
8	Construction de kiosque commerciale	unité
9	Mise en place de bacs à ordures	unité



Quantité	Prix Unitaire	TOTAL EP Ankisirasira	Total EP Nosikely
2	12,000,000.00	24,000,000.00	24,000,000.00
			-
20	600,000.00	12,000,000.00	12,000,000.00
20	200,000.00	4,000,000.00	4,000,000.00
			-
20	1,000,000.00	20,000,000.00	20,000,000.00
		5,000,000.00	5,000,000.00
1	15,000,000.00	15,000,000.00	15,000,000.00
1		20,000,000.00	20,000,000.00
2	14,000,000.00	28,000,000.00	28,000,000.00
6	5,000,000.00	30,000,000.00	20,000,000.00
20	200,000.00	4,000,000.00	4,000,000.00
		162,000,000.00	152,000,000.00
in USD		51,292.61	48,126.40

99,419.00

N° DESIGNATION	UNITE	QUANTITE	PRIX UNITAIRE
<b>I-INSTALLATION ET REPLI DE CHANTIER</b>			
1.1 Installation de chantier	Fft	1	
1.2 Repli de chantier	Fft	1	
<b>TOTAL INSTALLATION</b>			
<b>II-OUVRAGES EN INFRASTRUCTURE</b>			
2.1 Fouille en excavation	m3	6	30,000.00
2.2 Fouille en rigole	m3	23	15,000.00
2.4 Comblement des fouilles	m3	5	7,000.00
2.5 Béton de propreté	m3	2.5	250,000.00
2.6 Béton cyclopéen pour puits	m3	6	320,000.00
2.7 Film Polyane	m2	275	8,000.00
2.8 Coffrage	m2	97.28	25,970.00
2.9 Aciers pour ferrailage	kg	2530	11,000.00
2.10 Béton Q350	m3	23	496,000.00
2.11 Maçonnerie de moellons	m3	77.6	240,000.00
2.12 Remblai compacté	m3	33	11,000.00
2.13 Herissonnage	m3	17	150,000.00
2.14 Dallage en BA Q350 ep=10cm	m3	27	496,000.00
<b>TOTAL INFRASTRUCTURE</b>			
<b>III-OUVRAGES EN SUPERSTRUCTURE</b>			
3.1 Mur en Bloc de béton de 20x40x20cm	m2	462	60,000.00
3.2 Chape	m2	550	19,000.00
3.3 Coffrage	m2	785	25,970.00
3.4 Aciers pour ferrailage	kg	12320	11,000.00
3.5 Béton Q350	m3	112	496,000.00
3.6 poteau metallique de diamètre 15cm	U	14	1,300,000.00
<b>TOTAL SUPERSTRUCTURE</b>			
<b>IV-MENUISERIE</b>			
4.1 Porte ext. en PVC a deux vantaux de 1,6mx2,3m	U	3	2,500,000.00
4.2 Porte int. 1/2 vitrée en PVC 1V. de 1mx2,1m	U	4	1,400,000.00
4.3 Porte int. en PVC a deux vantaux de 2mx2,1m	U	1	2,600,000.00
4.4 Fenetre en PVC ouvrant a la francaise de 0,7mx1,6m	U	16	1,156,000.00
4.5 Fenetre en PVC ouvrant a la francaise de 0,5mx2,5m	U	5	1,036,000.00
4.6 Fenetre en PVC ouvrant a la francaise de 0,5mx1,24m	U	3	719,000.00
<b>TOTAL MENUISERIE</b>			
<b>V-PEINTURE- REVETEMENT-CARRELAGE</b>			
5.1 Enduit au mortier de ciment	m2	870	19,000.00
5.2 Enduit Bessier	m2	475	13,500.00
5.3 Peinture acrylique intérieure	m2	475	14,700.00
5.4 Peinture acrylique extérieure	m2	295	15,200.00
5.5 Peinture glycérophthalique	m2	8	16,300.00
5.6 Carrelage mural en faience	m2	9	80,000.00
5.7 Carrelage de sol en grès cérame	m2	275	120,000.00
<b>TOTAL PEINTURE-REJETEMENT-CARRELAGE</b>			
<b>VI- COUVERTURE ETANCHEITE</b>			
6.1 Système d'étanchéité en bitume pour toiture	m2	267	60,000.00
6.2 Gargouilles	U	10	50,000.00
<b>TOTAL COUVERTURE-ETANCHEITE</b>			
<b>VII-ELECTRICITE</b>			

7.1 Forfait installation electrique	Fft	1	4,000,000.00
7.2 Installation et pose reglette fluo 1,2m	U	12	85,000.00
7.3 Installation et pose reglette fluo 0,6m	U	2	60,000.00
7.4 Installation hublot étanche	U	6	60,000.00
7.5 Installation et pose prise électrique	U	21	25,000.00
<b>TOTAL ELECTRICITE</b>			
<b>VIII-PLOMBERIE</b>			
8.0 Pose de canalsation d'adduction et evacuation	Fft	1.00	1,500,000.00
8.1 Installation et pose d'évier bouble bac, yc robinetterie et évacuation	U	1	700,000.00
8.2 Fosse septique pour 50 personnes	Fft	1	15,000,000.00
8.3 Puisard d'absorption	U	1	3,000,000.00
<b>TOTAL PLOMBERIE</b>			
<b>IX- AMENAGEMENT EXTERIEUR</b>			
Construction d'un WC exterieur à 4 compartiments, yc			
9.1 pose des appareils sanitaires, laves mains, urinoirs, adduction d'eau et raccordement à la fosse	Fft	1	6,000,000.00
Construction d'un reservoir en BA, yc etanchéité et			
9.2 raccordement au réseau et filtration	Fft	1	17,000,000.00
9.3 Aménagement paysager extérieur	Fft	1	5,000,000.00
<b>TOTAL AMENAGEMENT EXTERIEUR</b>			
<b>TOTAL</b>			

PRIX TOTAL (Ar)

25,742,845.80  
11,032,648.20  
**36,775,494.00**

180,000.00  
345,000.00  
35,000.00  
625,000.00  
1,920,000.00  
2,200,000.00  
2,526,361.60  
27,830,000.00  
11,408,000.00  
18,624,000.00  
363,000.00  
2,550,000.00  
13,392,000.00  
**81,998,361.60**

27,720,000.00  
10,450,000.00  
20,386,450.00  
135,520,000.00  
55,552,000.00  
18,200,000.00  
**267,828,450.00**

7,500,000.00  
5,600,000.00  
2,600,000.00  
18,496,000.00  
5,180,000.00  
2,157,000.00  
**41,533,000.00**

16,530,000.00  
6,412,500.00  
6,982,500.00  
4,484,000.00  
130,400.00  
720,000.00  
33,000,000.00  
**68,259,400.00**

16,020,000.00  
500,000.00  
**16,520,000.00**

4,000,000.00  
1,020,000.00  
120,000.00  
360,000.00  
525,000.00  
**6,025,000.00**

1,500,000.00  
700,000.00  
15,000,000.00  
3,000,000.00  
**20,200,000.00**

6,000,000.00

17,000,000.00  
5,000,000.00  
**28,000,000.00**  
**567,139,705.60** **180,872.34 USD**

Activité	Libellé
Refection d'une route d'évacuation	Route en Béton de 920m, à deux voies de 7m de large avec assainissement latéral maconné de 50x50cm, bordures en béton

Désignation	Unité	Quantité	Prix unitaire
Installation et repli de chantier	fft	1.00	11,000,000.00
reprofilage léger	fft	1.00	9,700,000.00
rehaussement de la digue de 40cm d'épaisseur, long de 460m, par des remblais de terre franche y compris arrossage et compactage couche par couche avec l'OPM	m3	2,368.00	101,844.17
Mise en place de geotextile y compris fixation et végétalisation	m2	2,024.00	32,000.00
evacuation deblai	m3	1,200.00	10,500.00
couche de base GCNT	m3	1,840.00	32,000.00
Armatures de repartition	m2	14,490.00	11,000.00
chaussée béton	m3	985.00	518,600.00
Signalisation horizontale	fft	1.00	700,000.00
fouille	m3	460.00	11,000.00
maconnerie de moellons	m3	630.00	230,000.00
Béton ceinture	m3	21.00	486,000.00
ferailage	kg	1,470.00	11,700.00
coffrage	m2	252.00	25,970.00
Saignée transversale	u	5.00	1,500,000.00
			<b>TOTAL</b>

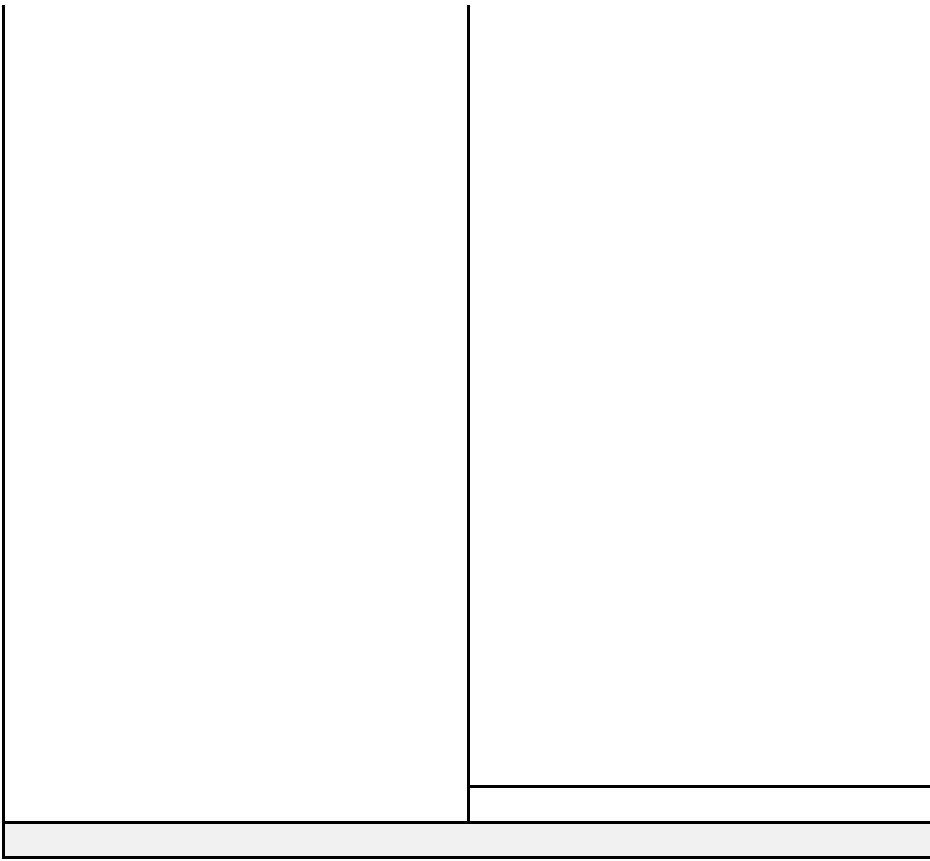
TOTAL (Ar)	Observations			
11,000,000.00				
9,700,000.00	HIMO/coût géré par l'entreprise		5000	8
241,166,994.56	Cette rubrique provient d'une evaluation technique pour éviter l'inondation du quartier d'Anksirasira SUD. Cette route permet non seulement d'évacuer, mais aussi de servir de digue contre les inondations lors de fortes marées			
64,768,000.00				
12,600,000.00				
58,880,000.00				
159,390,000.00				
510,821,000.00				
700,000.00				
5,060,000.00				
144,900,000.00				
10,206,000.00				
17,199,000.00				
6,544,440.00				
7,500,000.00				
<b>1,260,435,434.56</b>	<b>401,978.40 USD</b>			





-	9,700,000.00		<b>9,700,000.00</b>
---	--------------	--	---------------------

Activité	
Construction des ponts	Tanambao 16m
	BEMOKIJA 13m
	Rapiera 30m



Désignation	Unité	Qté	PU [Ar]
Installation et repli de chantier	fft	1	10,290,372.00
Démolition pont existant	fft	1	4,550,000.00
Mise en place d'une déviation	fft	1	5,300,000.00
Béton infrastructure	m3	50	486,000.00
Coffrage infrastructure	m2	400	25,970.00
ferrailage infrastructure	kg	5500	9,700.00
Béton armé q350	m3	32.6	486,000.00
Armatures	kg	3586	9,700.00
Coffrage	m2	216	25,970.00
Appareils d'appui	u	10	534,333.00
Garde corps	ml	26	321,871.00
gargouille	u	24	11,437.00
Joint chaussée	ml	7.7	108,037.00
signalisation verticale	u	8	138,000.00
Marquage au sol	fft	1	50,000.00
Couche de revêtement	m3	2.035	1,233,733.00
couche d'accrochage	m2	50.82	37,461.00
reprofilage léger	m3	11.55	4,533.00
Materiaux selectionnes	m3	6.35	73,772.00
remblai	m3	5.78	12,000.00
Peinture	fft	1	1,200,000.00
Enrochement	m3	10	210,000.00
Démolition de la déviation	fft	1	4,230,000.00

TOTAL

Installation et repli de chantier	fft	1	10,511,667.00
Démolition pont existant	fft	1	5,250,000.00
Mise en place d'une déviation	fft	1	7,200,000.00
Béton infrastructure	m3	64.65	486,000.00
Coffrage infrastructure	m2	517.2	25,970.00
ferrailage infrastructure	kg	5172	9,700.00
Béton armé q350 SS	m3	26.41	496,000.00
Armatures SS	kg	1717	9,700.00
Coffrage SS	m2	237.7	25,970.00
Appareils d'appui	u	8	534,333.00
plots	u	40	41,577.00
gargouille	u	27	11,437.00
Joint chaussée	ml	7.7	108,037.00
Signalisation verticale	u	8	138,000.00
Marquage au sol	fft	1	50,000.00
Couche de revêtement	m3	3.8	1,233,733.00
couche d'accrochage	m2	86.7	37,461.00
reprofilage léger	m3	11.55	4,533.00
Materiaux selectionnes	m3	7.51	73,772.00
remblai	m3	6.9	12,000.00
Peinture	fft	1	1,500,000.00
Enrochement	m3	15	210,000.00
Démolition de la déviation	fft	1	5,400,000.00

TOTAL

Installation et repli de chantier	fft	1	13,140,000.00
-----------------------------------	-----	---	---------------

Démolition pont existant	fft	1	5,850,000.00
Mise en place d'une déviation	fft	1	7,300,000.00
Béton infrastructure	m3	95.94	486,000.00
Coffrage infrastructure	m2	863.46	25,970.00
ferrailage infrastructure	kg	10553.4	11,000.00
Béton armé q350 SS	m3	56.117	496,000.00
Armatures SS	kg	3648.625	11,000.00
Coffrage SS	m2	673.404	25,970.00
Appareils d'appui	u	10	534,333.00
plots	u	62	41,577.00
gargouille	u	50	11,437.00
Joint chaussée	ml	14.44	108,037.00
signalisation verticale	u	8	138,000.00
Marquage au sol	fft	1	50,000.00
Couche de revêtement	m3	6.54	1,233,733.00
couche d'accrochage	m2	163.64	37,461.00
reprofilage léger	m3	24.56	4,533.00
Materiaux selectionnes	m3	10.84	73,772.00
remblai	m3	13.008	12,000.00
Peinture	fft	1	1,700,000.00
Enrochement	m3	22.1	210,000.00
Démolition de la déviation	fft	1	6,200,000.00
			TOTAL
			<b>TOTAL POUR 3 Ponts</b>

Total [Ar]	Remarques	Détails HIMO		
10,290,372.00		Nbr Homme	Prix journalier	Nbre jours
4,550,000.00	HIMO/coût géré par l'entreprise	25.00	5,000.00	21.00
5,300,000.00	HIMO/coût géré par l'entreprise	25.00	5,000.00	15.00
24,300,000.00				
10,388,000.00				
53,350,000.00				
15,843,600.00				
34,784,200.00				
5,609,520.00				
5,343,330.00				
8,368,646.00				
274,488.00				
831,884.90				
1,104,000.00				
50,000.00				
2,510,646.66				
1,903,768.02				
52,356.15				
468,452.20				
69,360.00				
1,200,000.00				
2,100,000.00				
4,230,000.00	HIMO/coût géré par l'entreprise	25.00	5,000.00	15
<b>192,922,623.93</b>	<b>61,526.93 USD</b>			
10,511,667.00				
5,250,000.00	HIMO/coût géré par l'entreprise	30	5000	23
7,200,000.00	HIMO/coût géré par l'entreprise	30	5000	15
31,419,900.00				
13,431,684.00				
50,168,400.00				
13,099,360.00				
16,654,900.00				
6,173,069.00				
4,274,664.00				
1,663,080.00				
308,799.00				
831,884.90				
1,104,000.00				
50,000.00				
4,688,185.40				
3,247,868.70				
52,356.15				
554,027.72				
82,800.00				
1,500,000.00				
3,150,000.00				
5,400,000.00	HIMO/coût géré par l'entreprise	30	5000	15
<b>180,816,645.87</b>	<b>57,666.09 USD</b>			
13,140,000.00				

5,850,000.00	HIMO/coût géré par l'entreprise	30	5000	25
7,300,000.00	HIMO/coût géré par l'entreprise	33	5000	15
46,626,840.00				
22,424,056.20	1079.33			
116,087,400.00	13191.75			
27,834,032.00	70.15			
40,134,875.00	4560.78			
17,488,301.88	841.76			
5,343,330.00	12.50			
2,577,774.00	77.50			
571,850.00	62.50			
1,560,054.28	18.05			
1,104,000.00	10.00			
50,000.00	1.25			
8,068,613.82	8.18			
6,130,118.04	204.55			
111,330.48	30.70			
799,688.48	13.55			
156,096.00	16.26			
1,700,000.00				
4,641,000.00				
6,200,000.00	HIMO/coût géré par l'entreprise	33	5000	15
335,899,360.18	107,125.11 USD			
709,638,629.98	226,318.14 USD	230,000		

Prix HIMO	Transport/matériel	Matériau	Total
2,625,000.00	1,925,000.00		<b>4,550,000.00</b>
1,875,000.00	1,450,000.00	1,975,000.00	<b>5,300,000.00</b>

1,875,000.00	2,355,000.00		<b>4,230,000.00</b>
--------------	--------------	--	---------------------

3,450,000.00	1,800,000.00		<b>5,250,000.00</b>
2,250,000.00	2,150,000.00	2,800,000.00	<b>7,200,000.00</b>

2,250,000.00	3,150,000.00		<b>5,400,000.00</b>
--------------	--------------	--	---------------------



3,750,000.00	1,725,000.00		<b>5,475,000.00</b>
2,475,000.00	2,750,000.00	2,075,000.00	<b>7,300,000.00</b>

2,475,000.00	3,725,000.00		<b>6,200,000.00</b>
--------------	--------------	--	---------------------

## C1

N°	Désignation	Unite	Quantité	Prix Unitaire	Prix Total Ar
1	Installation et repli de chantier	fft	1	18,500,000.00	18,500,000.00
2	Fouille en tranchée	m3	390	15,000.00	5,850,000.00
3	Evacuation de déblais	m3	340	35,000.00	11,900,000.00
4	Comblement de fouille	m3	50	7,000.00	350,000.00
5	Béton de propreté Q250	m3	16	250,000.00	4,000,000.00
6	Coffrage en bois dur	m2	885	25,970.00	22,983,450.00
7	Armatures en acier	kg	16614	11,000.00	182,754,000.00
8	Béton en superstructure Q350	m3	142	496,000.00	70,432,000.00
9	Enduit étanche	m2	641	15,500.00	9,935,500.00
10	Enrochement	m3	3	210,000.00	630,000.00
11	Exutoire	U	1	3,000,000.00	3,000,000.00
12	Dalle	U	50	275,400.00	13,770,000.00
TOTAL					344,104,950.00

109,742.04 USD

## OVERVIEW

Drainage locations	Cost		Avoided damage / loss of life				
	MW KWA	USD	Beneficiaries	Schools/clinics/markets	Pupils	KWA/beneficiary	USD/Beneficiary
Mitya ward	19,882,563.75	27,835.59	828	1	1114	24,012.76	33.62
Sadzi ward	59,134,663.58	82,788.53	874	2	?	67,659.80	94.72
Chambo ward	#REF!	#REF!	0	3	?	-	-
Mpira ward	22,435,315.20	31,409.44	322	0	-	69,674.89	97.54
Chinamwali ward	47,321,820.00	66,250.55	1380	2	800	34,291.17	48.01
Ndangopuma	65,454,996.38	91,636.99	552	1	1585	118,577.89	166.01
<b>TOTAL</b>	<b>#REF!</b>	<b>#REF!</b>					

## MTIYA

Intervention	Material	Length section (m)	Height	Width	Construction length	m3	m	Cost/m3	Cost	USD
Excavation in rock of large drain		50	1.4	2.2			154	5,000.00	770,000.00	1,078.00
Excavation in material other than rock		150	1.4	2.2			462	1,500.00	693,000.00	970.20
Large drain on hill to streams (A=2.33m2)	Base	200	0.05	1.66			16.6	110,000.00	1,826,000.00	2,556.40
	Walls	200	1.4	0.3	2	168		38,000.00	6,384,000.00	8,937.60
	Culverts							94,000.00	1,128,000.00	1,579.20
	Bedding for culverts	12	1	1				110,000.00	145,200.00	203.28
		12	0.05	2.2			1.32	110,000.00	145,200.00	203.28
Excavation in rock of small drain		10	0.5	0.5			2.5	5,000.00	12,500.00	17.50
Excavation in material other than rock		240	1.4	2.2			739.2	1,500.00	1,108,800.00	1,552.32
Small drain in front of school (A=0.49m2)	Base	250	0.0275	0.6			4.125	38,000.00	156,750.00	219.45
	Walls	250	0.7	0.3	2	105		38,000.00	3,990,000.00	5,586.00
Crossover Slabs over small drain (1x0.5x0.2m)	Reinforced concrete					10		15,000.00	150,000.00	210.00
Subtotal									16,364,250.00	22,909.95
Site mobilization (5%)									818,212.50	1,145.50
VAT									2,700,101.250	3,780.14
Total									19,882,563.75	27,835.59

Drainage works in Sadzi ward

Intervention		Material	Lengt section (m)	Height	Width	#	m3	m	Cost/m3	Cost	USD	
Excavation in rock			50	0.5	1.4		35		5,000.00	175,000.00	245.00	
Excavation in material other than rock			200	0.5	1.4		140		1,500.00	210,000.00	294.00	
Roadside drains (A=0.21m2)	Base	Reinforced concrete	1655	0.0275	0.6		27.3075		110,000.00	3,003,825.00	4,205.36	
	Walls	Local masonry	1655	0.4	0.3		2	397.2	38,000.00	15,093,600.00	21,131.04	
	Roads	Road preparation and soil compaction	400	0.1	4			160	1,500.00	240,000.00	336.00	
	Drains	Check dams	0.6	0.2	0.3		60	2.16	38,000.00	82,080.00	114.91	
Crossover Slabs over roadside drains (1x0.5x0.2m)		Reinforced concrete					500		15,000.00	7,500,000.00	10,500.00	
Excavation in material other than rock	River Mkwezula	Soil	1200	1	3		3600		1,500.00	5,400,000.00	7,560.00	
Reconstruction of banks (river training) (A=6.5m2)	River Mkwezula	Compacted soil	800	0.2	6		960		6,000.00	5,760,000.00	8,064.00	
	River Mkwezula	Local masonry	400	2	0.3		240		38,000.00	9,120,000.00	12,768.00	
	River Mkwezula	Check dams (local masonry)	3	1	0.3		50	45	38,000.00	1,710,000.00	2,394.00	
Reconstruction of culverts	River Mkwezula	Culverts	4	1	1				94,000.00	376,000.00	526.40	
										Subtotal	48,670,505.00	68,138.71
										Site mobilization (5%)	2,433,525.25	3,406.94
										VAT	8,030,633.325	11,242.89
										Total	59,134,663.58	82,788.53

Drainage works in Mtyia ward

Intervention		Material	Lengt section (m)	Height	Width	#	m3	m	Cost/m3	Cost	USD
Excavation in rock			100	0.5	1.4			70	5,000.00	350,000.00	490.00
Excavation in material other than rock			180	0.5	1.4			126	1,500.00	189,000.00	264.60
Roadside drain between hill and dwellings (A=0.55)	Base	Reinforced concrete	280	0.0275		1		7.7	110,000.00	847,000.00	1,185.80
	Walls	Local masonry	280	0.6		0.3	2	100.8	38,000.00	3,830,400.00	5,362.56
	Roads	Road preparation and soil compaction	140	0.1		4		56	1,500.00	84,000.00	117.60
Crossover Slabs over roadside drain (1x0.5x0.2m)		Reinforced concrete					40		15,000.00	600,000.00	840.00
Excavation in material other than rock		Soil	1200	1		3		3600	1,500.00	5,400,000.00	7,560.00
Downdrains (A=0.55)	Base	Reinforced concrete	380	0.0275		1		10.45	110,000.00	1,149,500.00	1,609.30
	Walls	Local masonry	380	0.6		0.3	2	136.8	38,000.00	5,198,400.00	7,277.76
	Check dams (local masonry)		1	0.3		0.3	19	1.71	38,000.00	64,980.00	90.97
Construction of culverts		Culverts	8	1		1			94,000.00	752,000.00	1,052.80
Subtotal										18,465,280.00	25,851.39
Site mobilization (5%)										923,264.00	1,292.57
VAT										3,046,771.200	4,265.48
Total										22,435,315.20	31,409.44

Drainage works in Chinamwali ward

Intervention	Material	Lengt section (m)	Height	Width	#	m3	m	Cost/m3	Cost	USD
Down drains (A=0.83)										
Excavation in rock		450	0.8	1		360		5,000.00	1,800,000.00	2,520.00
	Base Reinforced concrete	450	0.0275	1		12.375		110,000.00	1,361,250.00	1,905.75
	Walls Local masonry	450	0.8	0.3	2	216		38,000.00	8,208,000.00	11,491.20
	Roads Road preparation and soil	450	0.1	3		135		1,500.00	202,500.00	283.50
Collector drains (A=0.5)										
Excavation in material other than rock		500	0.8	0.7		280		1,500.00	420,000.00	588.00
	Base Reinforced concrete	500	0.0275	0.7		9.625		110,000.00	1,058,750.00	1,482.25
	Walls Local masonry	500	0.8	0.3	2	240		38,000.00	9,120,000.00	12,768.00
	Roads Road preparation and soil	500	0.1	2		100		1,500.00	150,000.00	210.00
Main drain (average A=1.7)										
Excavation in material other than rock		450	0.9	2		810		1,500.00	1,215,000.00	1,701.00
	Base Reinforced concrete	450	0.0275	2		24.75		110,000.00	2,722,500.00	3,811.50
	Walls Local masonry	450	0.9	0.3	2	243		38,000.00	9,234,000.00	12,927.60
	Check dams (local masonr	2	0.4	0.3	50	12		38,000.00	456,000.00	638.40
Crossover Slabs over roadside drain (1x0.5x0.2m)	Reinforced concrete					200		15,000.00	3,000,000.00	4,200.00
Subtotal									38,948,000.00	54,527.20
Site mobilization (5%)									1,947,400.00	2,726.36
VAT									6,426,420.000	8,996.99
Total									47,321,820.00	66,250.55



Drainage works in Masongola ward

Intervention	Material		Lengt secti	Height	Width	#	m3	m	Cost/m3	Cost	USD
School drainge interceptor ditch (A=0.625)											
Excavation in rock			20	0.3		2	12		5,000.00	60,000.00	84.00
Excavation in material other than rock			150	0.3		2	90		1,500.00	135,000.00	189.00
	Base	Reinforced concrete	170	0.1		2	34		110,000.00	3,740,000.00	5,236.00
	Culverts	including inlet and outlet structures in masc	6	1		1			94,000.00	564,000.00	789.60
	Bedding fo	Reinforced concrete	6	0.05		2.2	0.66		110,000.00	72,600.00	101.64
Roadside drain (A=1.25)											
Excavation in rock			350	0.8		1	280		5,000.00	1,400,000.00	1,960.00
Excavation in material other than rock			200	0.8		1	160		1,500.00	240,000.00	336.00
	Base	Reinforced concrete	550	0.0275		1.3	19.6625		110,000.00	2,162,875.00	3,028.03
	Walls	Local masonry	550	1		0.3	2	330	38,000.00	12,540,000.00	17,556.00
	Roads	Road preparation and soil compaction	550	0.1		3	165		1,500.00	247,500.00	346.50
Downdrain (A=0.8)											
Excavation in rock			500	0.8		1	400		5,000.00	2,000,000.00	2,800.00
Excavation in material other than rock			750	0.8		1	600		1,500.00	900,000.00	1,260.00
	Base	Reinforced concrete	1250	0.0275		1	34.375		110,000.00	3,781,250.00	5,293.75
	Walls	Local masonry	1250	0.8		0.3	2	600	38,000.00	22,800,000.00	31,920.00
		Check dams (local masonry)	2	0.4		0.3	50	12	38,000.00	456,000.00	638.40
Crossover Slabs over downdrains drain (1x0.5x0.2m)		Reinforced concrete					100		15,000.00	1,500,000.00	2,100.00
	Culverts	including inlet and outlet structures in masc	12	1		1			94,000.00	1,128,000.00	1,579.20
	Bedding fo	Reinforced concrete	12	0.05		2.2	1.32		110,000.00	145,200.00	203.28
Subtotal										53,872,425.00	75,421.40
Site mobilization (5%)										2,693,621.25	3,771.07
VAT										8,888,950.125	12,444.53
Total										65,454,996.38	91,636.99

# BILL OF QUANTITIES FOR THE CONSTRUCTION OF NAMALAKA (2 MILI

## BILL NO. 2.1: PRELIMINARY AND GENERAL

ITEM	DESCRIPTION	UNIT
2.1.01	Contractor's mobilization on site	Sum
2.1.02	Transportation of Contractor's plant and equipment	Sum
2.1.03	Provision of surveyor and survey equipment	Sum
2.1.04	Provision of concrete workability test equipment	Sum
2.1.05	Remove existing timber deck and place away from channel	Sum
2.1.06	Remove existing masonry deck marker posts located on abutments and piers	Sum
2.1.07	Remove mass concrete abutment and pier caps and prepare surface to receive new reinforced concrete caps	Sum
2.1.08	Remove surface water from excavations except for subterranean water	Sum
2.1.09	Provide and install project identification sign boards	Sum
2.1.10	Traffic accommodation (road signs e.g road closed, etc)	Sum
2.1.11	Provide detours for cyclists and pedestrians only	Sum
<b>TOTAL FOR BILL NO. 2.1 CARRIED TO SUMMARY</b>		

## BILL NO. 2.2.1: MEASURED WORKS

ITEM	DESCRIPTION	UNIT
	<u>BUSH CLEARING</u>	
2.2.1.01	Remove from site any grass, shrubs, debri, rubbish, and demolish building	m <sup>2</sup>
	<u>SUBSTRUCTURAL WORKS</u>	
2.2.1.02	Setting out timber profiles in readiness for excavation works	Sum
	<u>EXCAVATION</u>	
2.2.1.03	Excavate foundation trenches maximum depth 3 m for abutment, wing walls and piers	m <sup>3</sup>
2.2.04	Disposal of excavated material off site maximum distance 300 meters	m <sup>3</sup>
2.2.1.05	Allow for earthwork support to sides and ends of foundation trenches to avoid risks of collapse	Sum
2.2.1.06	Allow for excavation in bed rock	m <sup>3</sup>
2.2.07	Allow for drilling of bed rock to receive 20mm dowel bars	no
	<u>CONCRETE WORK</u>	
2.2.1.08	Mass concrete work Class 30/20 in abutments, wing walls and piers	m <sup>3</sup>
2.2.1.09	Supply and install dowel bars in bed rock	m
	<u>MASONRY WORK</u>	
2.2.1.10	Provide 300 mm masonry work for abutments, wing walls and piers complete with point finish	m <sup>3</sup>
2.2.1.11	Allow for provision of diversion of water and pumping out water for substructure works	Sum
22.1.12	drill holes rock and install dowel bars 20mm	no
2. 2.1.13	concrete on approach and roads	m3
2.2.1.14	reshape approach roads	m
2.2.2.15	construct masonry drains towards the bridge	m3

	<b>TOTAL FOR BILL NO. 2.2.1 CARRIED TO SUMMARY</b>	

<b>BILL NO. 2.2.2      MEASURED WORKS</b>		
ITEM	DESCRIPTION	UNIT
	<b><u>2 ABUTMENT CAPS</u></b>	
	<b><u>DOWEL BARS</u></b>	
2.2.2.12	Supply and installation of high yield steel dowel bars into masonry abutments and RC caps	Kg
	<b><u>FORMWORK</u></b>	
2.2.2.13	Formwork more than 300 mm wide at any inclination more than 85 degrees up to and including 90 degrees to the horizontal	m <sup>2</sup>
2.2.2.14	Formwork 300 mm wide or less at any inclination	m <sup>2</sup>
	<b><u>STEEL REINFORCEMENT</u></b>	
2.2.2.15	High yield steel bar reinforcement, nominal size 16 mm and under, of 12 m length or less	Kg
	<b><u>CONCRETE WORK</u></b>	
2.2.2.16	In-Situ Concrete Class 20/20	m <sup>3</sup>
	<b><u>PIER CUP</u></b>	
	<b><u>DOWEL BARS</u></b>	
2.2.2.17	Supply and installation of high yield steel dowel bars into into masonry piers and RC cap	Kg
	<b><u>FORMWORK</u></b>	
2.2.2.18	Formwork more than 300 mm wide at any inclination more than 85 degrees up to and including 90 degrees to the horizontal	m <sup>2</sup>
2.3.19	Formwork 300 mm wide or less at any inclination.	m <sup>2</sup>
	<b><u>STEEL REINFORCEMENT</u></b>	
2.2.2.20	High yield steel bars reinforcement, nominal size 16 mm and under of 12 m length or less	Kg
	<b>TOTAL 2.2.2 CARRIED TO SUMMARY</b>	

<b>BILL NO. 2.2.3      MEASURED WORKS</b>		
ITEM	DESCRIPTION	UNIT
	<b><u>CONCRETE WORK FOR PIER</u></b>	
2.2.3.21	In Situ Concrete Class 20/20	m <sup>3</sup>
	<b><u>CONCRETE PIER.</u></b>	
	<b><u>FORMWORK</u></b>	
2.2.3.22	Formwork more than 300 mm wide horizontal or at any inclination up to and including 5 degrees to the horizontal	m <sup>2</sup>
2.2.3.23	Formwork more than 300 mm wide at any inclination more than 85 degrees up to and including 90 degrees to the horizontal	m <sup>2</sup>
2.2.3.24	Formwork 300 mm wide of less at any inclination.	m <sup>2</sup>
	<b><u>STEEL REINFORCEMENT</u></b>	

2.2.3.25	High yield steel bar reinforcement, nominal size 16 mm and under, of 12 m length or less.	Kg
2.2.3.26	High yield steel bar reinforcement, nominal size 20 mm and over, of 12 m length or less.	Kg
	<u>MOVEMENT JOINTS</u>	
2.2.3.27	Supply and installation of 20mm thick flexible bituminous layer on expansion layer on expansion joints.	m <sup>2</sup>
	<b>TOTAL FOR BILL NO. 2.2.3 CARRIED TO SUMMARY</b>	

### BILL SUMMARY FOR NAMALAKA (2 MILLION) BRIDGE

BILL NO	DESCRIPTION	AMOUNT
2.1	PRELIMINARY AND GENERAL 2.1	
2.2	MEASURED WORKS	
2.3	BILL NO. 2.2.2	
2.4	BILL NO. 2.2.3	
2.5	BILL NO. 2.2.4	
2.6	TOTAL OF BILLS	
2.7	Add 15% of total of bills for contingency to be expended on written instructions of the engineer and to be deducted in whole or in part if not used.	
2.8	Add 16.5% Surtax to total of bills	
	<b>TOTAL CARRIED TO FORM OF MAIN SUMMARY</b>	

ION) BRIDGE

QTY	RATE(MK)	AMOUNT(MK)
1	5,000,000.00	5,000,000.00
1	1,000,000.00	1,000,000.00
1	50,000.00	50,000.00
1	50,000.00	50,000.00
1	100,000.00	100,000.00
1	100,000.00	100,000.00
1	100,000.00	100,000.00
1	50,000.00	50,000.00
2	500,000.00	1,000,000.00
2	100,000.00	200,000.00
1	100,000.00	100,000.00
		7,750,000.00

QTY	RATE(MK)	AMOUNT (MK)
200	550.00	110,000.00
		-
1	20,000.00	20,000.00
		-
261	1,000.00	261,000.00
261	500.00	130,500.00
1	50,000.00	50,000.00
15	5,000.00	75,000.00
30	15,000.00	450,000.00
		-
50	130,000.00	6,500,000.00
22	5,000.00	110,000.00
		-
180	38,000.00	6,840,000.00
1	50,000.00	50,000.00
120	2,000.00	240,000.00
15	94,000.00	1,410,000.00
100	1,000.00	100,000.00
45	38,000.00	

		<b>16,346,500.00</b>

QTY	RATE(MK)	AMOUNT(MK)
58	7,000.00	406,000.00
		-
12	15,000.00	180,000.00
2	15,000.00	30,000.00
		-
312	7,000.00	2,184,000.00
		-
5	110,000.00	550,000.00
		-
		-
29	7,000.00	203,000.00
		-
5	15,000.00	75,000.00
1.5	15,000.00	22,500.00
		-
93	7,000.00	651,000.00
		<b>4,301,500.00</b>

QTY	RATE(MK)	AMOUNT(MK)
100	110,000.00	11,000,000.00
		-
		-
96	15,000.00	1,440,000.00
45	15,000.00	675,000.00
25	15,000.00	375,000.00
0		-

500	7,000.00	3,500,000.00
300	7,000.00	2,100,000.00
		-
7.5	20,000.00	150,000.00
		<b>19,240,000.00</b>

OUNT (MK)
7,750,000.00
16,346,500.00
4,301,500.00
19,240,000.00
47,638,000.00
7,145,700.00
7,860,270.00
<b>62,643,970.00</b>

**USD 87,370**

ITEM		UNITS	QTY
<b>1</b>	<b>South Drainage rehabilitation</b>		
1.1	Site cleaning, including the removal of vegetation and solid waste (Total extension x channel width)	m <sup>2</sup>	68,400.00
1.2	Excavation of top soils along the drainage course canal (0,30 depth)	m <sup>3</sup>	20,520.00
1.3	Concret reinforced slopes	m <sup>2</sup>	480.00
1.4	Green belt implantation on the slope to protect against erosion	m <sup>2</sup>	22,800.00

<b>2</b>	<b>North Drainage maintenance</b>		
2.1	Site cleaning, including the removal of vegetation and solid waste (Total extension x channel width)	m <sup>2</sup>	25,600.00
2.2	Excavation of top soils along the drainage course canal (0,30 depth)	m <sup>3</sup>	7,680.00

<b>3</b>	<b>Drainage channels Nº1 - NB-05 Construction details</b>		
3.1	Site cleaning, including the removal of vegetation and solid waste (total extension x 5.0 m wide)	m <sup>2</sup>	2110
3.2	Soil Excavation and disposal to the establishment of the drainage ditches with all the complementary compaction and regularization of the pavement bed works (approx. 1000m)	m <sup>3</sup>	278.52
3.3	Supply and installation of B18 concrete walls, including formwork and complementary works (approx. 1000m)	m <sup>3</sup>	152.71

<b>4</b>	<b>Drainage channels Nº2 - NB-04 Construction details</b>		
4.1	Site cleaning, including the removal of vegetation and solid waste (total extension x 5.0 m wide)	m <sup>2</sup>	1375
4.2	Excavation to the establishment of the drainage ditches with all the complementary compaction and regularization of the pavement bed works (approx. 1000m)	m <sup>3</sup>	181.5
4.3	Supply and installation of B18 concrete walls, including formwork and complementary works (approx. 1000m)	m <sup>3</sup>	99.51

<b>5</b>	Construction of three sets of drainage pipes and valves with high capacity	un	3
----------	--	----	---



UNIT PRICE (USD)	TOTAL COST
0.48	32,737.72
14.36	294,639.44
14.36	6,892.15
0.64	14,550.10
<b>Subtotal 1</b>	<b>348,819.40</b>

0.48	12,252.71
14.36	110,274.41
<b>Subtotal 2</b>	<b>122,527.12</b>

0.64	1,350.40
19.14	5,330.87
647.73	98,914.85
<b>subtotal 3</b>	<b>105,596.12</b>

0.64	877.47
19.14	3,474.79
647.73	64,456.06
<b>Subtotal 4</b>	<b>68,808.33</b>

85,000.00	255,000.00
<b>Subtotal</b>	<b>255,000.00</b>

<b>TOTAL</b>	<b>900,750.97</b>
--------------	-------------------

Budget for Construction Project				
Project Title: SAFE HAVENS, CHOKWE				
Item	Item Description	Unit	Qty	Cost per Unit
<b>1</b>	<b>PRELIMINAR WORKS</b>			
1.1	On-site establishment, building of warehouse for works and materials.	item	1	850.00
1.2	Removal, cleaning and general earthmoving.	m <sup>2</sup>	600	0.50
1.3	Building implantation works.	item	1	175.00
				<b>SUBTOTAL 1</b>

<b>2</b>	<b>PLATAFORM AND FOUNDATIONS</b>			
2.1	Opening of headgear for sabots and foudations instalations.	m <sup>3</sup>	12	2.00
2.2	Foundation bed crushing and compacting.	m <sup>3</sup>	25	30.00
2.3	Supply and application of cleaning concrete in foundation bed, 5 cm thick by 80 cm wide. Dosage 1:4:7.	m <sup>3</sup>	6	95.00
2.4	Supply and application of reinforced concrete in foundation basis: 80x80x30cm.	m <sup>3</sup>	6	110.00
2.5	Supply and installation of massive blocks of 20 cm in foundations and platform box including slab.	m <sup>2</sup>	464	12.00
2.6	Landfill and compaction of the remaining excavation of the foundations and platform using the soil of the excavation itself. Compression in layers of 20cm maximum.	m <sup>3</sup>	957	2.50
				<b>SUBTOTAL 2</b>

<b>3</b>	<b>CONCRETE FLOORS AND TABLES</b>			
3.1	Application of reinforced concrete in accessible floor slabs, thickness 15cm. (Concrete-B-25 Steel 400).	m <sup>2</sup>	23	110.00
3.2	Application of reinforced concrete in the access ladder and respective levels. (Concrete-B-25 Steel 400).	m <sup>2</sup>	1	110.00
				<b>SUBTOTAL 3</b>

<b>4</b>	<b>SUPPLIES AND SUPER STRUCTURE</b>			
4.1	Supply and settling of 15cm cast blocks (in walls of final thickness 20cm), laid with cement mortar.	m <sup>2</sup>	224	11.00
4.2	Construction of reinforced concrete pillars 30x30cm from the foundations (4Ø16, #26x26, Ø6@15).	ml	198	45.00
4.6	Construction of beam on foundation basis and on platform of 20x30cm (4Ø10, #16x16, Ø6@20).	ml	466	10.00
4.5	Construction of 20x20cm beams (4Ø10, #16x16, Ø6@20).	ml	233	10.00
4.8	Construction of lintel over spans (doors and windows) of 15x20cm (4Ø10, #16x16, Ø6@20).	ml	25	7.50
4.10	Supply and installation of square grids A5 (15x15x10).	m2	29	10.00
				<b>SUBTOTAL 4</b>

<b>5</b>	<b>CARPENTRY</b>			
5.1	Supply and fixing of standard solid wood door 1.00x2.10m sheet including door ring, its accessories and hardware.	Un	5	175.00

5.4	Supply and fixing of solid wood windows, with an exterior leaf with glass, window sash with mosquito net in interior frame. Measure of span 1.00x1.60m. Including accessories and hardware.	Un	10	100.00
				<b>SUBTOTAL 5</b>

<b>6</b>	<b>COVER STRUCTURE AND COATING</b>			
6.1	Supply and assembly according to the design of metallic profiles IPE 15cm@200cm painted with primary paint and enamel finish.	un	15	200.00
6.2	Supply and assembly of lipped channel of 75cm @ 200 and piece of connection with IPE profiles, finishing with two primary coat paint.	un	30	40.00
6.3	Supply and fixing of galvanized iron plates of type IBR Pre-painted green 0.6 mm thick, including all accessories for fixing with "J" nail	m²	320	10.00
6.4	Provision of pre-painted galvanized sheet of the same thickness, at the top top of the cover and fixation with the wall. Width 60 cm.	ml	80	8.00
6.5	Supply and installation of gutters for collecting rainwater, including fixings and downspouts and their accessories, the drop point being at a height of 1 m from the inlet to the tanks	ml	29	15.00
				<b>SUBTOTAL 6</b>

<b>7</b>	<b>COATINGS AND FINISHES</b>			
7.1	Supply and application of screed in cement mortar and 1:3 sand on interior floors, balconies and stairs	m²	319	6.00
7.3	Painting of windows, doors and other elements in wood with oil paint on two appropriate primer coat.	lump sum	1	400.00
7.4	Painting of exterior and interior walls with PVA Exterior of first quality.	m²	224	3.00
7.5	Handrail on ladder metal tubing 2 "	ml	24	20.00
				<b>SUBTOTAL 7</b>

<b>8</b>	<b>TECHNICAL INSTALLATIONS (WATER SUPPLY, SANITATION AND ELECTRICITY)</b>			
8.2	Construction of sanitary block, supply and installation of wash basins, all hydraulic equipment, including taps and all accessories.	lump sum	2	7,000.00
8.5	Construction of septic tank, inspection chamber and drain with capacity for 120 people use.	un	1	2,500.00
8.3	Supply and installation of water supply piping and all necessary connections.	lump sum	1	750.00
8.4	Supply and installation of 20000 lt water tanks, connections and taps.	un	6	610.00
8.1	Electrical installation including all accessories	lump sum	1	3,000.00
				<b>SUBTOTAL 9</b>

<b>SUBTOTAL FINAL</b>
<b>Contingency (15%)</b>
<b>TOTAL (MZN) + 17%</b>

Total Cost
850.00
300.00
175.00
1,325.00

24.72
741.60
587.10
696.96
5,562.00
2,392.50
10,004.88

2,549.25
79.20
2,628.45

2,458.50
8,910.00
4,660.00
2,330.00
187.50
288.00
18,834.00

875.00

1,000.00
1,875.00

3,000.00
1,200.00
3,200.00
640.00
435.00
8,475.00

1,914.00
400.00
670.50
480.00
3,464.50

14,000.00
2,500.00
750.00
3,660.00
3,000.00
23,910.00

70,516.83
10,577.52
81,094.35

## Annex 2 – CROSS-CUTTING ISSUES

### **A. MARGINALISED AND VULNERABLE GROUPS ASSESSMENT**

This section aims to provide an overview on marginalised and vulnerable groups in the four cities involved in the project.

The data was gathered both through surveys, local consultations held in the targeted neighbourhoods and from official documents (desk review). Some data refers to the whole city, and other refers to the communities individually targeted by the project (sub-project sites). It is important to stress that the latter type relies in some cases on the perceptions of the community members themselves.

The population characteristics in the four cities are summarised in the following table (community-level data combined with the data from every project community in each city):

Group	Morondava	Zomba	Chokwe	Moroni
Children and youth rate	The majority (60% approx. < 15 years)*	40% approx. < 15 years*	44% approx. < 15 years*	The majority (mostly < 15 years)
Women and girls	> 50%*	> 50%	> 50%	> 50%
Older persons rate	Low (3% approx. > 60 years)*	Very low		Low
Indigenous people	N/A	N/A	N/A	N/A
Tribal groups	N/A	N/A	N/A	N/A
Displaced/ migrant people	Seasonal internal migrant families from the southern part of the Country (mostly fishermen)*	Seasonal internal migrant from the rural areas*	N/A	Internal migrant families from the rural areas/ flood-affected areas (only in La Coulée neighbourhood)
Refugees	N/A	N/A	N/A	N/A
Persons with disabilities rate	Very low*	Very low	Very low	Very low
People living with HIV/AIDS rate	Under-reported; no reliable data are available*	Under-reported; no reliable data are available	Adult men, young and elderly women are the most affected; no reliable data on children are available	Under-reported; no reliable data are available
Other marginalised/vulnerable groups	<ul style="list-style-type: none"> <li>Albinos*</li> <li>Lepers*</li> </ul>	N/A	N/A	Fishermen (they are particularly vulnerable due to the pollution in the sea)
Poverty	25% below poverty line	16.3 % poor 3% ultra-poor	60% below poverty line	45.6% (poverty rate)

\* City level data

More detailed information about each city is provided below.

## **Morondava**

Children and youth: in the city the majority of children live in single-parent families (usually the mother) and a high level of early marriage is reported. Domestic violence (toward children) is quite high while support for children victims of violence (included sexual violence) is very low. Families are generally supported by community associations. There is also sporadic support from international organizations such as UNICEF through distribution of food, counselling, etc.

In the targeted communities children generally attend school and can speak and read Malagasy; however, only a few can read or speak French. The school is not far from where they live but the number of students per class is quite high (44 children per class on average). For infants, there are a few crèches and support structures in the target communities. Child labour is mainly domestic.

Almost 90% of the people living in the most vulnerable areas of the city are food insecure and/or malnourished. Given the poor sanitary conditions in these areas, children present different types of diseases, from diarrhoea to skin diseases. Infant mortality is still high in the entire city. Most of the youth (75%) between 13 and 18 years old go to school but less than half get a degree. As for the children, they all know Malagasy while only a minority can fluently read or speak in French. There is gender balance in the classes although, especially for the girls (mainly due to early pregnancy), the school drop-out rate is high. Schools are not properly equipped in terms of educational materials and the number of pupils per class is high. Access to job opportunities or technical training (outside the technical colleges) is very low.

Women and girls: the majority of women can read and write in Malagasy but not in French; in general, the educational level of women is lower than men due to early marriage, early pregnancy, poverty and cultural/traditional habits.

Many women are single parents (divorced or widowed) with five children on average. Divorced women are usually stigmatised, abandoned by the families and forced to leave the house with the children. Gender-based violence and domestic violence rates are very high throughout the city. It has been reported that in many communities, there is one case of rape per day and 35% of women are exposed to prostitution. There seem to be no women's support services in the city; there are only some project-based programs (dependent on funding) implemented by organizations in the most vulnerable areas.

Almost 60% of women are unemployed; they are usually excluded from formal jobs and are engaged in informal businesses or temporary/seasonal jobs (including mangroves). There are no reported restrictions on women's freedom to access public spaces and in decision-making; nevertheless, women's active engagement is quite limited. Traditional and cultural gender dynamics still play a key role in the communities.

Older persons: some of them live alone while others live with their family. They are generally considered a "burden" for the families (often already poor) and, therefore, not always accepted and integrated. The majority have ageing-related physical problems such as mobility and deafness. In many communities, there are elderly associations taking care of the older persons.

Displaced/migrant families: in the city there are seasonal (from March to December) internal migrant families from the southern region of the country. They are usually fishermen and they reside in the most vulnerable areas. They are not well accepted in the host communities and conflicts over resources are frequent. Migrant children do not always go to school.

Persons with disabilities: There is an equal distribution between males and females with disabilities; some of them have congenital disabilities, others have disabilities due to diseases and ageing. They live with their families but are generally considered a burden; many of them are dependent on other family members (meaning not head of the family). It has been reported that stigma is still high. The level of education for persons with disabilities is generally low and they are inactive (they do not work and do not look for any employment). Disability associations at the community level and religious institutions are the main institutions that take care of

persons with disabilities; nevertheless, given the limited resources, access to basic services remains the major challenge for this group.

People living with HIV/AIDS: HIV/AIDS is increasing as a consequence of gender-based violence, early marriage, early pregnancy and increasing prostitution. It should be noted that there is not sufficient awareness about this topic, especially among young women.

Other marginalised/vulnerable groups: no data is available on the exact number of albinos in the city; they are usually stigmatised and marginalised. It is also reported that there is a community of victims of leprosy: they are quite isolated and excluded by the rest of the communities. They are mainly assisted by religious organizations and the children attending schools are stigmatised.

## **Zomba**

Children and youth: in the targeted communities the number of orphans among children and youth is still high due to the increasing rate of HIV/AIDS. Orphans usually live with the extended family. Food insecurity and children with severe malnutrition due to poverty is very high (almost 90% of the targeted communities are food insecure). Children living with single parents have increased in the last years. The number of domestic violence cases in Zomba has also increased: the cases concern more girls than boys. In some of the target communities, there are children's support programs managed by local NGOs but regular financing remains a challenge. Malaria, TB, respiratory infections, diarrhoea and other communicable diseases are still one of the main causes of morbidity among children and youth. This is mostly due to poor housing and inadequate sanitary conditions. Some communities are benefiting from the schools feeding programs.

The majority of children and youth can speak the local language but cannot read or write in English. In general, children face multiple barriers to enrolment and satisfactory performance in school including: cost of school uniforms and materials, lack of concentration due to insufficient nutrition intake, withdrawal due to need for children to work at home and – more generally – neglect by the parents. There are different technical colleges in the city but not easily accessible by less educated and marginalised/vulnerable youth.

Youth unemployment is very high in the target communities; lack of opportunities for training and/or skills development has been reported as one of the main challenges. The Youth Public Works Programme (managed by the Government) remains one of the main opportunities even if salaries are low and it is a temporary employment rotation programme. The main market in the city (the biggest in the surrounding area) and the wood cutting season offer temporary jobs.

Women and girls: discrimination against women and girls is still rooted in a lack of gender equality, and discriminatory traditional norms. Women still experience serious challenges in accessing and controlling productive resources and opportunities outside the management of the home. Within the households, decisions are taken by the male counterpart. Women and girls generally participate in the life of their communities, but they do not actively take part in it or get involved in decision-making. There is a sort of acceptance (by the women) of this situation. Under Malawian law, men and women have equal ownership rights to property, however under customary law women's access to land is often through the head of family, who are usually men. Despite no legal restrictions on women's access to financial services including credit, they face difficulties due to the need for supporting documents and guarantees. In general, their educational attainment level is lower than men.

The number of single female heads of family (separated/divorced or widowed) is generally high in the target communities. There are also high rates of child marriage (customary law does not set a minimum age for marriage) and maternal mortality due to early marriage, early pregnancy, poverty and insecurity. Physical and sexual violence frequently leads to increased rates of HIV/AIDS and sexually transmitted diseases.



The main employment opportunities for women are in public works programme (tree planting, road maintenance, waste collection, etc.). The salary is low, but these jobs at least provide some skills development. Some women have small businesses on the street (selling food/wood, etc.) and they are members of community savings/loans groups. Women are often the custodians of traditional knowledge, especially in relation to the use of seeds and plants.

Older persons: the majority live with their (extended) family. Most of them have physical problems (mobility, deafness, etc.) due to ageing and/or illness. Elderly support programmes are almost not existent and members of this group often live at the margins of society.

Displaced/migrant families: in the city there are seasonal internal migrants from the rural areas. They usually arrive during tree cutting season and stay for 3 to 4 months. They are well integrated in the community; it has been reported that they often marry, have children, then leave the family looking for other jobs and come back the next year. Hence, there are many female heads of the family in the community, and “seasonal families.”

Persons with disabilities: in the target communities there is an equal distribution between male and female persons with disabilities. They may have both mentally and physical disabilities and usually live with the family. It has been reported that stigma is still high, due to the fact that disability, especially mental disorder, is associated with alcohol and illicit drug abuse, brain disease and spirit possession. Mental disorder in women is often due to psychological trauma.

The level of education of persons with disabilities is generally low and they are generally inactive. Almost all disabled children do not attend school as a result of a lack of social and financial support. In some communities, local NGOs have programs to support persons with disabilities.

People living with HIV/AIDS: HIV/AIDS is increasing as a consequence of gender-based violence, early marriage, early pregnancy and increasing levels of prostitution. There are few interventions at the community level and insufficient awareness, especially amongst young women. They are largely excluded from essential services and lack the protection of the family and community. This often leaves them at risk of exploitation and abuse.

## **Chokwe**

Children and youth: in the targeted communities, girls are the majority among children. Most of them live in extended families. In general, children go to schools near their home, and most of them can speak Portuguese. When they are not in school, they support the family in domestic activities and in the informal market. Some cases of child work have been reported in Neighbourhood n.5. Almost all children play in the street. Adequate public spaces for them are reported in two of the targeted neighbourhoods and consist of two football fields.

Women and girls: in the targeted neighbourhoods the majority of women are single parents with more than two children. They can generally speak or read Portuguese. Women are actively involved (sometimes more than men) in community life where their relevant role in the decision-making processes is well-recognised. They usually work in the same area where they live, mostly in the informal sector and many of them belong to women's saving groups. Women believe that their participation in community life is very important for social and economic well-being.

Older persons: some older persons live alone while others live with extended families. Most of them have no disabilities but do not speak Portuguese. All of them (including those who have disabilities) participate in the life of the community. Most of them originate from Chókwè.

Persons with disabilities: among children and youth both physical and mental disabilities have been reported (among children the main disability is mental). Most of the persons with physical disabilities are assisted by their families. They can speak or read in Portuguese and go to school. They are well integrated into the community, actively participating in community life, especially those between 18 and 35 years. Communities consider the contribution of persons

with disabilities to be relevant and really value these people. In general, they do not work and do not look for any employment. In the targeted neighbourhood, most of the disabled women are reported in Neighbourhood n.4.

People living with HIV/AIDS: most people living with HIV/AIDS are assisted by their family; they practice all kinds of economic activities, go to school, participate in community life. There is no stigma; communities consider the contribution of people living with HIV/AIDS to be relevant.

## **Moroni**

Children and youth: in Moroni children normally live with their families and play within their houses/compounds. In Medina, they usually play in the streets because there is no space for playing at home even if it is not a child-friendly neighbourhood. In both targeted neighbourhoods of the project the majority go to school and can read and speak French. However, school drop-out and discontinuity is quite frequent mainly due to poverty. It has been reported that child labour is low even if children usually contribute to household management. Access to employment or training opportunities in the city is extremely limited. In both neighbourhoods, the majority of youth are unemployed; some of them are employed in occasional or informal jobs and some are still studying. In Medina they usually work in the market, especially young women. There is still quite a high level of child mortality, mainly due to diseases (poverty related and HIV/AIDS). Other major diseases affecting children and youth are malaria, cholera and diarrhoea, all linked to poor water and sanitation conditions.

Women and girls: traditional and cultural gender dynamics still play a key role in the targeted communities. It has been reported that almost half of the total households are headed by women: the majority of them are divorced, very poor and often stigmatised and marginalised. A high number of women above 20 are unmarried and still living with their family.

Women are allowed to work, and they attend school equally to men, but the majority of them prefer to stay at home and take responsibility for household management. They usually manage the food and water budget. The majority of the working women are in the informal sector and they work in the big market in Medina. Women are members of associations, but a gender unbalance has been reported in key positions. Women have less access to opportunities in comparison to men and rarely have access to credit. Gender-based violence, including domestic violence (physical, verbal and psychological) is still high.

Older persons: the elderly live with their family (sometimes extended family); the majority have physical problems due to ageing. The layout of the two neighbourhoods is not friendly to older persons: in fact, Medina is narrow and overcrowded, while La Coulée is located on a steep slope. Few of them can read or speak French.

Displaced/migrant families: in La Coulée, there are internal migrant families from the rural/flood-affected areas, from other islands, and from the City Centre (Medina) that is overpopulated. The neighbourhood has limited space for children to play and has few schools. Usually, they are second generation displaced households and they are quite well integrated. In Medina, no displaced or migrant households are reported.

Persons with disabilities: they are generally quite well accepted by their families and communities even if they are not actively engaged and integrated in their activities. They usually stay at home and contribute to household management. Due to the limited resources, persons with disabilities experience difficulty in accessing basic services and/or opportunities. The majority of them are dependent on other family members (meaning not head of the family). Their level of education is generally low and they are inactive socially. It has been reported that stigma is low.

People living with HIV/AIDS: HIV/AIDS is increasing as a consequence of gender-based violence. Few interventions exist at the community level and there is insufficient awareness, especially in relation to mother to child transmission. Significant stigma has been reported.

## **SECTION B. GENDER STRATEGY**

### **1. Purpose**

This section provides an overview of how the project intends to contribute to promoting women's empowerment, gender equality and justice in the targeted countries, cities and communities. It explains and presents: (i) which considerations at regional, national and local levels have been taken into account; (ii) which aspects have been considered key for advancing gender equality and justice; (iii) how the different activities (within the different project components) contribute to the achievement of the four key areas of the SADC Gender Protocol (below); (iv) what are the indicators (for each project component) for monitoring and measuring effective contribution to women's empowerment, gender equity and justice.

### **2. Initial gender assessment**

The SADC Gender Protocol includes the SDGI (SADC Gender and Development Index) with 36 indicators measuring progress on achieving gender equality in the member States. They have been categorised in four key areas: access, voice, choice and control. The SADC Gender Protocol Barometers (2017) highlight that, in general, across the region the gender gap in SADC is still very high with a SDGI average score of 61%.

For the purpose of this project, five aspects - across the four key areas - have been selected as crucial in providing an indication of the status of resilience of women in relation to climate change variability and exposure to risks. The five aspects are: (i) Education; (ii) Access to productive resources; (iii) Gender-based violence (GBV), health and other social and cultural practices; (iv) Media, information and communication; (v) Climate change and sustainable development.

In relation to the four target countries, these five key aspects provide a quick overview of the status of women in the countries and in the target cities. There is, however, limited official data at the city level and on the Union of Comoros. It has therefore been assumed that the general trends in the countries are applicable to the four target cities. For the Union of Comoros, through the consultations held in the different communities/municipalities, these same trends have been confirmed.

A deeper gender baseline study in the four cities will be carried out at the beginning of project implementation.

Education: The level of education of women (including all forms of education, beyond school classrooms) is still low in the three countries. School graduation attainment is lower than enrolment.

	Madagascar	Mozambique	Malawi	Comoros
Girls secondary education rates (%)	32	19	36	N/A

Women's consultations have confirmed that – in the communities – women's education (in the wider sense) plays a central role in coping and adaptive capacity since it is often linked to access to information and risks knowledge. Thus, people with higher levels of education are less vulnerable and possess greater adaptive capacity to risks.

Access to productive resources: Women in the four countries remain under-represented in economic decision-making and have less access to economic opportunities, resources and ownership in relation to their male counterparts. Further, the perception of the gender divide in household tasks and the idea that women are subordinate to men is still quite high. In general a decline in women's labour-force participation has been recorded in the last two years in these countries.

	Madagascar	Mozambique	Malawi	Comoros
% of women in decision making	17	25	13	N/A
% of women with access to economic opportunities	16	18	18	N/A

Consultations have confirmed that access to economic resources and livelihood diversification is generally linked to a situation of “flexibility and adaptivity”, especially during crisis/disaster. They also provided an indication of the decision-making power of women and their stronger participation and interest in climate change adaptation/mitigation activities. Women have limited access to credit and other insurance system at the local level – which is key, since it often leads to a slow capacity to recover from a disaster/crisis.

Gender-Based Violence (GBV), health and other social and cultural practices – such as child marriage, teenager pregnancies – are still frequent. Despite the existence of GBV laws in these countries, evidence has shown that they have not always been translated into enforcement and implementation. Still, the legislation criminalising rape/violence is not extended to marital rape/violence. In terms of access to health services, especially for pregnant women, these countries have made progress even if Malawi still has a high rate of maternal mortality, especially in urban contexts where sanitation conditions are precarious.

The percentage of HIV positive women is still high in these countries (data for Comoros not available).

	Madagascar	Mozambique	Malawi	Comoros
% of women who experience GBV	55	50	45	N/A
Maternal Mortality Ratio (per 100,000)	353	490	634	N/A
Women who are HIV positive	46	58	59	N/A
Comprehensive knowledge of HIV/AIDS (%)	3	66	70	N/A

Consultations with women confirmed that the high rate of GBV, HIV and maternal mortality provides a general overview of women’s vulnerabilities and of their level of disempowerment.

Media, information and communication: women’s access to media and communication is still very low in these countries.

	Madagascar	Mozambique	Malawi	Comoros
% of women with access to media	21	25	21	N/A

During the women’s consultations, it was recognised that access to information and communication is key since a higher level of awareness and knowledge can lead to a quicker reaction, especially in preventing or responding to crises and disasters. Furthermore, access to communication and the media can provide a space where women can be heard.

Climate change and sustainable development: in these countries the percentage of women involved in climate change decision-making and as positive agents for climate change mitigation/adaptation is low. Among many reasons, the SADC Gender Barometer refers to a lower awareness and knowledge by women regarding climate change, and less participation in developing mitigation/adaptation initiatives at the local level, even if their knowledge and skills could potentially be higher than their male counterparts.

	Madagascar	Mozambique	Malawi	Comoros
% of women in climate	33	17	8	N/A

change decision-making				
% of sources on gender and climate change	23	30	14	N/A

Consultations held with public officials and other stakeholders confirmed the lack of space for women to become “agents of change” in relation to effective response to climate variability. Community consultations revealed that women show a higher degree of self-mobilisation and most belong to self-help women’s groups. This clearly indicates the level of women’s cohesiveness and participation in the community, and if leveraged, provides an opportunity for building community resilience and enhanced participation around climate change and exposure to risks.

Climate change variability has a greater impact on women in all four target countries. Since they are generally responsible for collecting water and preparing food, in all consulted communities it was observed that at times of crisis or disaster the daily tasks of women have increased. During the recent El Niño drought that affected all four countries to different extents, women had to walk longer distances many times a day (usually during sunrise/sunset) to collect water. This increased their exposure to violence, negatively impacted their health and nutritional status and affected their caring responsibilities for other family members, especially children. Due to a lower availability of food and increased food prices in the market, women and girls received and self-selected for less food to ensure the health of their children and male relatives. Many cases of malnutrition have been registered among pregnant and breastfeeding women. There are increasing reports of child marriage in all interviewed communities. In an effort to reduce the number of mouths to feed and increase the family resources through the dowry, young girls have been forced to marry wealthier men resulting in school drop-out and curtailing their opportunities in life. Other girls have been forced into exploitative behaviours, including sexual abuse, to obtain resources for themselves and their families. Many interviewers have indicated that crises and disasters increase tension within their households, leading to a higher likelihood of domestic violence.

In all the four cities, the variability in income (also due to the impact of climate change) has pushed men to leave their communities in search of employment in neighbouring cities or countries, leaving the women as heads of households under precarious conditions. In all four countries women are more restricted from travel due to the cultural context. They usually stay at home or are engaged in informal business on the streets. They are therefore more exposed to the risks associated with climate change such as local flooding and air/ground pollution due to water scarcity. Local flooding can have a disruptive effect and compromise their informal economic activities for many weeks. Women are also more reluctant to leave their houses when floods happen since they often feel responsible for the household assets.

Nevertheless, in all consulted communities, women have shown a greater capacity and ability to adapt than men, and –given their role of caregivers- to develop resilient skills quicker than their male counterparts. Women are generally more active than men in responding to disasters.

### 3. Project design

Based on the findings of the initial gender assessment and on the mandate of UN-Habitat as part of the United Nations system, the project intends to promote gender equality by: (i) reducing the vulnerability of women while building their resilience to climate risks; and ii) empowering women by promoting an enabling environment where they are not considered as vulnerable individuals but as powerful agents of change.

The three components of the project are therefore designed to challenge the gender-based discrimination culture characterising the four target countries, cities and communities. In particular, the project components contribute directly or indirectly, - at different extents and levels- to the achievement of four aspects that are crucial for advancing gender equality and

justice and promoting the empowerment of the women: 1. Access to resources; 2. Raising voice; 3. Right to choose; and 4. Control over resources.

**Component 1** is designed around a set of 23 sub-projects that will be implemented in the four target cities. These sub-projects are grouped into six thematic categories: (i) Improvement of drainage capacity; (ii) Establishment of early warning systems; (iii) Improvement of solid waste management; (iv) Construction of multi-purpose safe-havens; (v) Rehabilitation/protection of critical ecosystems and sustainable use of natural resources; and (vi) Improvement of urban mobility through construction/rehabilitation of roads and bridges.

The sub-projects aiming to **establish early warning systems (EWS) and safe-havens** entail the participation and active involvement of at least 60% women. In particular, while developing EWS the meaningful participation of women will ensure that their role as primary household caregivers and as first responders in case of imminent risks is recognised and enhanced. Similarly, while designing safe-havens, women (especially the most vulnerable) will be actively involved in ensuring that their own needs are properly addressed and that the proposed layout solutions take advantage of their knowledge and capacity. Alert dissemination and evacuation procedures will be tailored to the needs and different behavioural patterns of women and men. Means of communication will be reachable and understandable to both women and children, especially the most vulnerable, in order to ensure that they have full control over their protection. Their participation in training/capacity building activities and simulation exercises will provide them access to information and knowledge from which they are traditionally excluded. Women's capacity to mobilise people, network and their sense of solidarity will be taken into consideration and reflected in evacuation procedures during emergencies.

Regarding sub-projects focusing on **improving solid waste management**, responsible community groups will be composed at least 50% by women. A gender analysis will be conducted in the target areas and included in the waste management strategy and waste management training plans. Women's active involvement in waste-related activities will grant them access and control over resources, such as waste equipment and waste management centres. Importantly, the daily working period (from morning to early afternoon) will be defined so that it will not compromise their role as household manager. Waste operation plans, including timetables and division of tasks between women and men, will ensure that women are part of the decision-making process and will enable women to take up leadership positions in managing waste operations. Access to technical knowledge (related to the management of different types of waste) and increased awareness of the link between waste and climate change will raise their interest and create opportunities for women to be more actively engaged in other waste-related activities such as creating art and handicrafts out of the waste. Additional income for the households will promote a sense of autonomy for the women and, ultimately, challenge the traditional gender power relations within the households. It is then envisaged that the equal participation of women in the community groups responsible for managing waste operations will provide a space for women's aggregation and enable dialogue among women on other critical issues such as GBV, HIV-AIDS, etc.

The sub-projects dealing with **rehabilitation/protection of ecosystems and sustainable use of natural resources** will enable women to access important information and to promote their role in conservation and protection of natural resources. Women often spontaneously adopt climate change mitigation/adaptation measures to address risks. These positive behaviours will be valued by the project, as they can be enhanced through greater community participation and involvement. Women's involvement in ecosystem rehabilitation has been proven effective and their active participation in training and capacity building activities will allow them to share their knowledge and take the lead in advocating for more sustainable environmental practices that reduce disaster risks within their communities. Communities will be sensitised on the importance of adopting a gender lens and approach for the development of the ecosystem initiatives and related awareness initiatives, and maintenance and conservation plans will

allocate specific roles to women. During implementation, jobs' timetables will be developed in a way that respects women's household responsibilities, and fair salary and no discrimination between men and women will be ensured.

The sub-projects aiming to improve **urban drainage conditions** and **mobility (roads and bridges rehabilitation/construction)** will enable women to benefit from enhanced mobility and a subsequently increased sense of independency, which is especially important during emergency times. They will also be better protected from flooding and stagnating waters that can generate water-borne diseases. While implementing these sub-projects a gender lens will be adopted regarding the design of roads, bridges and drainage systems so that women's practical needs can be taken into account in terms of movement and physical safety, especially for pregnant women, mothers with small children and older persons. It will then indirectly promote discussions in the targeted communities around gender-sensitive urban development and city layout/architectural design. Constructions execution plans, work timetables and related arrangements will be discussed with women and take their needs into consideration, and equal salaries between male and female workers will be guaranteed.

"Safe spaces" will be established at all relevant project sites in all four cities, for receiving inputs/complaints/concerns from women/ female workers.

**Components 2 and 3** refer to institutional, policy, training and capacity building and exchange of experiences between cities and between countries. Planned activities under these project components will offer the opportunity for increasing women's engagement in high-level climate change discussions, decision-making processes and to learn from others. Gender-based discussions and informed decisions will translate into the design of gender-sensitive tools, guidelines, legislation and policies for enhancing climate adaptation in urban settings.

Full gender balance will be pursued in both the groups of participants in project activities at all levels, as well as in the construction of the management, implementation, training and leadership teams.

Data collection activities conducted within the project will ensure gender sensitivity and will be sex-disaggregated. All produced materials will be fully engendered.

Further information regarding the assessment of potential project risks related to gender equality and women's empowerment (especially as it relates to the physical interventions entailed in the sub-projects of Component 1) and proposed mitigation measures is available in the Environmental and Social Management Plan in **Annex 3**.

#### **4. Monitoring, evaluation and learning**

Key indicators have been identified for each project component to monitor and measure their effective contribution to women's empowerment, gender equity and justice.

*Under Project Component 1: Preparation, implementation and sustainable management of priority sub-projects at the city level*

- **Indicators on the establishment of community early warning system and construction of safe-havens**
  - Nr of women who take active part in the design of the EWS and evacuation procedures;
  - Nr of women who participate in training/capacity building activities and have acquired life-saving skills;
  - Nr of gender-sensitive aspects in the design of EWS and of safe-havens, division of roles and responsibilities and other issues related to early warning dissemination to communities;

- % of women who consider that the established EWS and safe-haven design respond to their needs and are gender-sensitive; and
- % of people within a given community/neighbourhood who are more aware on the important role played by women in early warning and evacuation procedures.
- **Indicators on the improvement of solid waste management**
  - % of women within the community groups responsible for solid waste management;
  - Nr of women who participate in training/capacity building and awareness-raising activities;
  - % of waste operations managed/controlled by women;
  - % of women with increased awareness regarding the link between waste and climate change;
  - % of people within a given community/neighbourhood who are more aware of the important role played by women in waste-related activities; and
  - Nr of opportunities per month for women's discussions on critical issues as GBV, HIV/AIDS, etc.
- **Indicators regarding the rehabilitation/protection of ecosystems and the sustainable use of natural resources**
  - Nr of women who are engaged in ecosystems rehabilitation/protection activities and the sustainable use of natural resources;
  - Nr of women who participate in related training and capacity building activities;
  - % of women who lead/ participate in awareness campaigns within targeted communities for promoting more sustainable environmental practices to reduce/prevent disaster risks; and
  - % of people within a given community/neighbourhood who are more aware that women can play a transformative leadership role in sustainable environmental management.
- **Indicators regarding the improvement of drainage and urban mobility (roads and bridges) conditions**
  - Nr of women who are consulted in the design of streets/bridges and drainage system;
  - % of women who are satisfied with the way roads, bridges and drainage systems were rehabilitated; and
  - Increased awareness within a given community on the need to advocate for more gender-sensitive urban development.

*Indicators for Components 2 and 3: Tools and guidelines development and training delivery at the national level and inter-country experience sharing, cross-fertilisation and dissemination of lessons learned at the regional level*

- % of women who are actively part of high-level climate resilience decision-making processes and platforms;
- Increased awareness of the need to take gender-informed decisions at national and regional levels regarding urban climate resilience; and
- % of urban climate resilience tools, guidelines, policies and legislation at national level that are gender-sensitive.



## **SECTION C. HUMAN RIGHTS APPROACH**

The project has been designed by putting the rights of the people to a dignified life at the centre. It has been planned and will be implemented by adopting a people-centred and human rights approach entailing the promotion – in all activities - of an enabling environment for people to concretely exercise their rights while promoting a process of accountability by the duty bearer towards the communities and all stakeholders. In doing so, the project has taken into consideration the last Human Rights Council Periodic Review “*Report of the Working Group on the Universal Periodic Review*” for the four Countries (Madagascar, December 2014; Malawi, July 2015; Mozambique, April 2016; Comoros, April 2014) and related recommendations for fulfilling human rights obligations, and the Amnesty International reports for the four Countries for the years 2017-2018.

Special attention will be paid to ensuring the participation, at all levels, of marginalised and vulnerable persons and communities, including women and people living with low incomes, who are not protected by law and with poorly recognised rights (see Section A of this Annex for details on these groups in the target cities). Their participation is essential to strengthen their capacity to face stresses and shocks. By highlighting the needs and special considerations of these marginalised and vulnerable populations, the project will draw the attention of the national and city governments to these areas and issues and strengthen the dialogue within these populations. It will build their understanding of the political system and reinforce their role in the planning process, hence promoting a culture of social dialogue based on citizens’ participation.

This section presents key challenges that each country faces in relation to the enjoyment of human rights and how the sub-projects of Component 1, in all their phases (from planning to implementation until the achievement of impacts), as well as project Components 2 and 3, contribute to the progressive implementation of the recommendations (by the Government).

### ***COMPONENT 1 – Preparation, implementation and sustainable management of priority sub-projects at the city level***

- **Group 1: Establishment of early warning systems**

**Design phase:** These initiatives have been designed through extensive consultations with all the marginalised and vulnerable groups (see Section A of this Annex), in particular women, older persons and persons with disabilities, who had equal opportunity in providing inputs and expressing their perceptions and needs during the sub-project design phase.

**Implementation phase:** In the implementation phase, continuous attention will be given to ensuring that the EWS equally meets the expectations of communities - especially women, older persons, persons with disability and albinos - and fairly addresses their security and safety needs and perceptions. Particular attention will be paid to reach the albinos who are traditionally neglected and not included in “community-based” mechanisms. The EWS will be built on existing community protection capacities (existing self-protection mechanism) and it will, therefore, provide a platform for further discussing the concept of “protection” and “safety” especially for the most vulnerable groups.

**Impact:** Developed EWS will ensure equal and fair access to all the groups to information about imminent climate related risks; action will be taken based on informed decisions; and actions and decisions will be accessible, non-discriminatory and equally appropriate for all segments of society.

- **Group 2: Construction of multi-purpose safe havens**

**Design phase:** These initiatives have been designed through the involvement of different stakeholders. The local governments have been held accountable for making sure that the right to safety can be exercised by all the people, without discrimination. The people, especially women, children, persons with disabilities and older persons, have been informed of their right

to have access to a safe place in case of imminent risks. The layouts of the multi-purpose havens have been designed by equally assessing the needs/capacities (self-protection mechanism) of all the vulnerable groups and by giving a fair opportunity to all to express their ideas without prejudice.

**Implementation:** The implementation phase will include the establishment of a “safe space” for all to provide feedback (negative/positive) on implementation progress to allow on-going adjustments. The construction works will provide equal employment opportunities to all without distinction; a working environment that is respectful of the needs of the workers, especially the most marginalised and vulnerable groups, and working conditions which are respectful of the workers’ rights and compliant with ILO labour standards. Dialogue on the right of all to be protected without discrimination will be promoted.

**Impact:** the construction of the multi-purpose safe havens will contribute to the attainment of the right to be protected and safe in case of an imminent risk, without distinction and discrimination.

- **Group 3: Improvement of the solid waste management**

**Design phase:** These initiatives have been planned by providing opportunity to all marginalised and vulnerable groups to design (craft/express) their own ideas on how solid waste management should be improved for the benefit of all and not discriminatory. The planning, which included the layout of the recycling stations, has therefore incorporated the views of all the groups in an equal manner. The initiative has been planned to indirectly contribute to create economic opportunities for marginalised and vulnerable populations and - therefore – contribute to the right to a decent work.

**Implementation phase:** The implementation phase will be realised through a process that ensures a “safe space” for all to provide feedback (negative/positive) on the implementation to allow on-going adjustments. The implementation will: (i) provide equal and inclusive employment opportunities to all without distinction; and (ii) a working environment that is respectful of the needs of the workers, especially the most marginalised and vulnerable groups, and working conditions which are respectful of the workers’ rights and comply with ILO labour standards and principles.

**Impact:** All marginalised and vulnerable groups will equally benefit from improved waste management which will ensure their right to safe and healthy living condition and accountability by the local government toward the right to access basic services. It will indirectly contribute to creating opportunities for sustainable livelihoods.

- **Group 4: Rehabilitation/protection of existing ecosystem and sustainable use of natural resources**

**Design phase:** These initiatives have been designed by putting the right of the people to live in a clean and sustainable environment at the centre of the design phase. During the planning, cities have been consulted and held accountable for environmental protection and the rights of the communities to a higher quality of life. Communities have been consulted on how productive environmental resources should be managed and protected in order to ensure equal access for all – including traditionally excluded marginalised and vulnerable groups. The cultural and traditional knowledge of the local people has been incorporated while planning these sub-projects.

**Implementation:** The implementation phase will be realised by ensuring the equal participation of all the marginalised and vulnerable groups in the implementation of the environmental activities to concretely address the root causes that are acting as barriers to their right to safe and sustainable living conditions. During implementation, the traditional knowledge of local people will be concretely applied. The implementation process will provide a “safe space” for all the marginalised and vulnerable populations to be informed, discuss and contribute to the promotion of local climate resilience development. This will enable adjustments during the

activities implementation progress. The activities will create employment and skills development opportunities, particularly for women. Working environments will be respectful of the needs of the workers, especially the most marginalised and vulnerable groups, and working conditions will be respectful of the workers' rights and comply with ILO labour standards and principles.

**Impact:** the rehabilitation/protection of existing ecosystem and use of natural resources will contribute to the attainment of the right to safe, clean and sustainable living conditions while holding the cities accountable to all the people.

- **Group 5: Improving drainage conditions**

**Design phase:** This category of sub-projects has been designed through extensive consultations at different levels and all the marginalised and vulnerable groups had equal access to participate and provide "safe and free" feedback on the planning/drainage lay out phase.

**Implementation phase:** The implementation phase will ensure full and fair participation and involvement in construction work, and an impartial feedback mechanism on drainage work progress. The construction works will offer employment opportunities for all the marginalised and vulnerable groups, with particular attention to the most affected, and create employment and skills development opportunities, particularly for women. Working environments will be respectful of the needs of the workers, especially the most vulnerable groups, and working conditions will be respectful of the workers' rights and comply with ILO labour standards and principles.

**Impact/Outcome:** The improvement of the drainage system will equally benefit all groups and contribute to providing access to safe and decent conditions of living. It therefore contributes to protecting people from harmful living conditions.

- **Group 6: Improved urban mobility through construction and/or rehabilitation of roads and bridges**

**Design phase:** These sub-projects have been planned by putting the right of safe and free movements -including voluntary displacement in case of disasters- at the centre of planning. Inclusive consultations were conducted at different levels to ensure that the perceptions, mobility needs and requirements of marginalised and vulnerable groups and the most affected are included in the design of the rehabilitation/construction works. Particular attention has been paid to the mobility needs of women and children, persons with disabilities and older persons.

**Implementation:** The implementation phase will be realised by ensuring that information on the progress of the construction/rehabilitation works will reach those who experience mobility problems and that they have the possibility to continuously provide inputs/feedback. During implementation, the mobility patterns/habits of communities will be taken into consideration. The construction works will offer employment opportunities for all the marginalised and vulnerable groups, with particular attention to the most vulnerable, and create employment and skills development opportunities, particularly for women. Working environments will be respectful of the needs of the workers, especially the most vulnerable groups, and working conditions will be respectful of the workers' rights and comply with ILO labour standards and principles.

**Impact:** Improved urban mobility will contribute to attaining the right to safe and free movements, included voluntary displacement in case of imminent risks or disasters.

All the initiatives have been planned and will contribute to addressing the following human rights challenges in the four countries - as reported in the "Report of the Working Group on the Universal Periodic Review" and Amnesty Report 2017-2018:

<b>Countries' challenges</b>	<b>Groups</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>Madagascar</b>							
Still restricted freedom of expression, especially on environmental/development issues	X	X	X	X	X	X	X
Low participation/representation of vulnerable groups in the local planning and decision-making	X	X	X	X	X	X	X
Gender discrimination largely present in many communities; economic dependence of women and/or lack of access to economic resources	X	X	X		X	X	X
Persistence of vulnerable conditions for vulnerable groups	X		X	X	X	X	X
Respect for the human right not fully embraced by the different actors and at different levels	X				X		
Weak process of inclusion		X		X			
Low protection awareness and consciousness		X					
Persistent poverty due to limited access to service delivery			X				
Existence of child labour			X				
Opposition towards defenders of environmental exploitation					X		
<b>Malawi</b>							
Discrimination against people with albinism, gender- based and HIV/AIDS affected groups and/or indigenous communities	X	X	X	X	X	X	X
Weak attention to safe conditions for the protection of the street children	X						
Weak attention to protect and promote safe conditions for marginalised communities				X			
Weak attention to safe conditions for the protection of the vulnerable communities/groups		X					X
Weak attention to protect and promote safe conditions for the workers			X				
Poverty reduction through infrastructure improvements and/or environmental sustainability	X				X	X	X
Non-guaranteed access to fair information for all		X					
Limited freedom of expression and access to information			X	X	X		
<b>Mozambique</b>							
Low women participation and inequality in access in the planning and/or decision-making processes	X	X	X	X	X	X	X
Limited freedom of expression	X	X	X	X	X	X	X
Limitation in protecting people with disabilities, elderly and people with albinism	X	X	X	X	X	X	X
Restricted access to information	X	X	X		X	X	X
Scarce delivery in public services	X		X				X
Limited promotion of decentralisation process		X			X		
Food insecurity/unemployment				X	X		

<b>Comoros</b>						
Weak human rights consciousness	X	X	X	X	X	X
Low participation of women and people with disabilities	X	X	X	X	X	X
Limited workers' protection	X		X		X	X
Low freedom of expression and information	X	X			X	
Limited platforms for communities' participation	X	X	X			
Limited security measures for vulnerable groups		X		X		

**COMPONENT 2: *Tools and guidelines development and training delivery at the national level***

**Design phase:** Component 2 was designed by taking into consideration the right of vulnerable and the most excluded groups to be represented and take informed decisions.

**Implementation:** The implementation of Component 2 will offer opportunities to women for presenting and advocating for gender sensitive policies/law in climate change decision-making platforms. It will support inclusive and participatory internal reflection on the country's existing accountability process towards human rights fulfilment.

**Impact:** Component 2 will contribute to creating a favourable environment for the rights of traditionally excluded groups to be represented and to take part in decision-making and national accountability processes.

**COMPONENT 3: *Inter-country experience sharing, cross-fertilisation and dissemination of lessons learned at the regional level***

**Design phase:** The Human Rights Council Periodic Review "Report of the Working Group on the Universal Periodic Review" for the four countries (Madagascar, December 2014; Malawi, July 2015; Mozambique, April 2016; Comoros, April 2014) and related recommendations for fulfilling human rights obligations and the Amnesty International reports for the four countries for the years 2017-2018 present similarities across the countries. In the design phase of this Component, these similarities have been taken into consideration.

**Implementation:** The implementation of Component 3 will promote inclusive and participatory dialogue, discussion and exchange of good practices on how climate resilience initiative can contribute to the Human Right Agenda and countries progress towards its attainment.

**Impact:** Component 3 will contribute to holding the Governments accountable to an inclusive, participatory and integrated approach to attaining human rights for all.

## **Annex 3 – Environmental and Social Management Plan (ESMP)**

### **Table of contents of the Annex:**

1. Purpose
2. Process to comply with the Adaptation Fund's (AF) Environmental and Social Policy (ESP)
3. Summary description of the project and rationale of the Annex
4. Screening, categorisation and ESMP for project Components 1, 2 and 3
5. Detailed screening and ESMP for project Component 1
6. Arrangements to implement the ESMP (*see also full proposal text Part III Section C*)

#### **1. Purpose**

The purpose of this overview is to demonstrate compliance of the project with the Environmental and Social Safeguards of the Adaptation Fund. It provides a summary of the measures taken in the project design phase to ensure that the project promotes positive environmental and social benefits and avoids, reduces, or mitigates adverse environmental and social risks and impacts taking into consideration the 15 Adaptation Fund principles. It further details the measures put in place to uphold the principles throughout project implementation. The Environmental and Social Management Plan (ESMP) provides the implementation mechanism for the environmental and social mitigation measures during the project implementation stage. Its objective is to forecast, prevent, manage and mitigate the potentially adverse impacts of the activities comprised within the project in a way that minimises the adverse impact on people and the environment.

#### **2. Process to comply with the AF ESP**

In line with the Adaptation Fund's Environmental and Social Policy (ESP) and Gender Policy (GP) UN-Habitat and concerned project partners completed a risk screening and impact assessment for all planned project components. In particular, for all sub-projects under Component 1 (see **Annex 5**) to be implemented at the local/city level, ESIA requirements have been followed by analysing relevant national standards and legislation and by verifying the requirements with concerned ministries and municipalities in the targeted countries and cities, respectively.

Community surveys and public consultations were used to collect disaggregated data focused on climate change related issues, needs and perceptions of marginalized and vulnerable groups, activity prioritisation and the identification and verification of potential risks and impacts (see **Annex 4**) where needed measures to avoid or mitigate potential risks have been duly identified. The risk screening and design of the ESMP was conducted in collaboration with local municipalities and communities, and its outcomes were subject to public consultations/ disclosure (see **Annex 4**), from which feedback was incorporated in the current version.

The ESMP contains the risk impact assessment, mitigation and monitoring measures to address the risks that were identified through the screening.

#### **3. Summary description of the project and rationale of the Annex**

The project has two objectives:

1. To develop capacities and establish conditions to adapt to the adverse effects of climate change in vulnerable cities of Madagascar, Malawi, Mozambique and the Union of Comoros, and
2. To promote inter-country experience sharing and cross-fertilisation regarding the adaptation to transboundary climate-related natural hazards and disseminate lessons learned for progressively building urban climate resilience in south-eastern Africa.

There are three project components, the first two contributing to objective 1 and the third one contributing to objective 2, namely:

1. Preparation, implementation and sustainable management of priority sub-projects at the city level;
2. Tools and guidelines development and training delivery at the national level, and
3. Inter-country experience sharing, cross-fertilisation and dissemination of lessons learned at the regional level.

In this Annex the project is presented at two levels. The first level is general, analysing all three components of the project (see Section 4 of this Annex). The second level zooms into the activities belonging to the first component (sub-projects implementation – the only level that includes physical interventions/ infrastructure projects) because it requires a more technical and detailed assessment and presents related risks and mitigation measures (see Section 5 of this Annex). The planned activities under project component 1 may entail more risks than the normative, planning and training activities under project components 2 and 3.

#### 4. Screening, categorisation and ESMP for Components 1, 2 and 3

An initial screening and assessment process was carried out to identify and evaluate the environmental and social risks and impacts of proposed activities for **the entire project**. Due to the nature of some of the proposed sub-projects under Component 1, the entire project has been categorised as **Medium Risk (Category B)**. Consequently, an ESMP was developed.

In terms of process, normative, planning and capacity development activities under Components 1, 2 and 3 were screened against the Adaptation Fund's 15 environmental and social principles. Then, if risks under a principle were identified, the ESMP was prepared accordingly. Table 1 below shows the results of both the screening and ESMP for the three components. More specifically, for the screening part, it is specified whether the risks exist or not, for each principle and for each component, and when no risk is identified, the evidence for the absence of the risk is presented. In case risk is present, a description of the risk (a synthetic and qualitative assessment) is provided, and mitigation measures are proposed, as ESMP. Overall, results from this screening show that potential risks impacts are not considered to be significant, as the project activities were designed to minimise potential risks. Nevertheless, measures will be undertaken to ensure that no environmental or social impacts can occur. General monitoring measures are presented in **Part III, Section C** of the main project document.

In terms of methodology, both the screening and ESMP development were carried out adopting the ESMP guidelines provided by the Adaptation Fund as a basis. From the guidelines, a list of questions and desk review resources necessary for screening the existence of risks under each principle were prepared. Results and, if required, mitigation measures emerged through field missions of environmental and social experts to all project sites, desk research, surveys, focus group discussions and community-led planning and decision-making processes. All steps, as mentioned under Section 2 of this annex, were presented for public disclosure in every city, the results of which are available in **Annex 4** (including links to supplementary documentation available online).

*Table 1: Risk screening and ESMP for project Components 1, 2 and 3*

Principle	Component 1*: Preparation, implementation and sustainable management of priority sub-projects at the city level  *the screening and assessment of risks for this component are presented in more detail in the table below by group of sub-projects.	Component 2: Tools and guidelines development and training delivery at the national level	Component 3: Inter-country experience sharing, cross-fertilisation and dissemination of lessons learned at the regional level	Overall potential risk in the project
1. Compliance with the Law	<b>Risk: NONE</b> <u>Evidence:</u> there are no obstacles to comply with national technical standards for developing sub-project implementation plans and technical studies (see <b>Part II.F</b> ). No additional measures.	<b>Risk: NONE</b> <u>Evidence:</u> the planned activities under this component will be implemented in respect of the countries' legislation.	<b>Risk: NONE</b> <u>Evidence:</u> the planned activities under this component will be implemented in respect of the SADC policies and strategies.	NONE
2. Access and equity	<b>Risk: YES</b> <b>Probability: low</b> <b>Significance: medium</b> <u>Evidence:</u> although the project preparation process has been fully participatory, there can still be a risk of non-equal participation / representation and decision-making during project implementation activities, which should be avoided. <u>Mitigation measures:</u> planned interventions will be presented to the target communities and their perceptions will be included in the detailed design. In addition, control mechanisms will be set up to ensure activities under implementation keep including representatives from all groups of the communities (with a particular focus on vulnerable and marginalised groups - Principle 3).	<b>Risk: YES</b> <b>Probability: low</b> <b>Significance: medium</b> <u>Evidence:</u> training and related tools may not adopt a fully inclusive and participatory approach during design, implementation and production of final results. <u>Mitigation measures:</u> different stakeholders will be mapped and their needs assessed while the training materials and tools. Training activities and related tools will take into consideration the social/economic impacts of climate change on these stakeholders. Synergy and cooperation among mechanisms among different sectors/departments at the national level will be developed.	<b>Risk: YES</b> <b>Probability: low</b> <b>Significance: medium</b> <u>Evidence:</u> planned cross-fertilisation and lesson-learned activities at the regional level may be weak in: (i) promoting sufficient exchange among countries on the social dimension of climate change; and (ii) adopting a fully inclusive approach to value the different countries' experiences and enabling all country representatives to actively participate and provide inputs. <u>Mitigation measures:</u> emphasis on the social dimension of climate change will be put in the regional agenda. The importance of civil society in regional strategies will be highlighted. All countries will be stimulated to actively participate in regional activities.	YES

3. Vulnerable and marginalised groups	<p><b>Risk: YES</b>  <b>Probability: low</b>  <b>Significance: medium</b></p> <p><u>Evidence:</u> women, children, older persons and persons with disabilities represent the vulnerable and marginalised groups in the target communities.</p> <p><u>Mitigation measures:</u> a more detailed mapping of the vulnerable and marginalised groups will be conducted prior sub-projects' implementation to further discuss and get their inputs on the detailed designs and proposed solutions. Communication channels with vulnerable people/households will be established. Finally, employment requirements in the different sub-projects' implementation will be discussed with these vulnerable and marginalised groups to ensure access to job opportunities.</p>	<p><b>Risk: YES</b>  <b>Probability: low</b>  <b>Significance: medium</b></p> <p><u>Evidence:</u> developed training and tools may not sufficiently promote understanding and linkages between climate change, marginalisation/vulnerability and poverty.</p> <p><u>Mitigation measures:</u> while developing these trainings and related tools, special attention will be paid to the social impact of climate change on the most marginalised and vulnerable categories. Social understanding will be strengthened across the different sectors/departments at the national level based on principles of equity and social justice, especially for the most marginalised and vulnerable people. While developing national policies/guidelines, transparent decision-making processes will be advocated, ensuring the inclusion vulnerable and marginalised people.</p>	<p><b>Risk: YES</b>  <b>Probability: low</b>  <b>Significance: medium</b></p> <p><u>Evidence:</u> cross-fertilisation and lessons-learned activities at the regional level may fail to take sufficiently into account the needs of the vulnerable and marginalised groups.</p> <p><u>Mitigation measures:</u> these regional activities will ensure that vulnerable and marginalised groups are included and their voice is heard. Special attention will be paid to solutions/initiatives that effectively address their needs and reduce their vulnerability to climate change. This will also be an occasion to strengthen regional policies to better take into account the needs of the most vulnerable and marginalised in the climate change agenda.</p>	YES
4. Human rights	<p><b>Risk: NONE</b></p> <p><u>Evidence:</u> it is the mandate of the UN to ensure that human rights are safeguarded. All activities have been designed and controlled to support this principle. The project will increase the quality of life of people and contribute to the attainment of human rights principles. Lastly, compliance with the law (see Principle 1) of the countries involved reinforces the compliance with this principle.</p>	<p><b>Risk: NONE</b></p> <p><u>Evidence:</u> all the countries adhere to the Human Rights Convention. Training and capacity development activities will therefore be carried out by referring to and respecting this principle.</p>	<p><b>Risk: NONE</b></p> <p><u>Evidence:</u> activities under this component are designed to support this principle. They will advocate for a stronger respect of human rights principles at the regional level.</p>	NONE
5. Gender equality and women's empowerment	<p><b>Risk: YES</b>  <b>Probability: low</b>  <b>Significance: medium</b></p> <p><u>Evidence:</u> there is a risk that women are excluded from the detailed design and implementation of sub-projects because of inadequate consultations/time tables and/or excluding skills/job requirements.</p> <p><u>Mitigation measures:</u> women's needs and perceptions will be systematically captured during the design phase. Awareness-raising activities and training sessions will be organised at community level to sensitise on the important role played by women in society and on the need to actively involve them in sub-projects' implementation. To encourage women's involvement, adequate security and safety conditions at the workplace will be ensured for the required positions will be proposed. Jobs time tables will be organised in a way that respect their household's responsibilities.</p>	<p><b>Risk: YES</b>  <b>Probability: low</b>  <b>Significance: medium</b></p> <p><u>Evidence:</u> trainings and tools to be developed and delivered may not take sufficiently into consideration gender issues in climate change. There is also a risk that women do not participate in national level activities equally as men.</p> <p><u>Mitigation measures:</u> activities under this component will ensure that women are fairly included and represented in training workshops, and their voice considered in the development of guidelines. Further, in developing training/capacity building activities, related tools and policies/guidelines, particular attention will be paid to incorporate gender-related aspects and empower women as agents of change and innovation to address climate change's negative impacts.</p>	<p><b>Risk: YES</b>  <b>Probability: low</b>  <b>Significance: medium</b></p> <p><u>Evidence:</u> cross-fertilisation and lesson-learned activities may not sufficiently adopt a gender lens in addressing climate change at the regional level, e.g. by including women's perspective in decision-making.</p> <p><u>Mitigation measures:</u> while implementing this component, it will be ensured that the voices of women are included and heard. Gender equality and women's empowerment will be highlighted as a key aspect in experiences' sharing. Discussions at regional/SADC level will be held on the importance of carrying out women-focused impact assessments in order to adopt gender-sensitive measures to respond to climate change issues.</p>	YES
6. Core labour rights	<p><b>Risk: YES</b>  <b>Probability: low</b>  <b>Significance: medium</b></p> <p><u>Evidence:</u> despite the four</p>	<p><b>Risk: NONE</b></p> <p><u>Evidence:</u> there is no risk related to the implementation of the planned activities under this component.</p>	<p><b>Risk: NONE</b></p> <p><u>Evidence:</u> there is no risk related to the implementation of this component.</p>	YES



	<p>countries having labour laws, not all ILO standards and principles are clearly regulated and enforced, especially the ones related to social security and occupational safety and health.</p> <p><u>Mitigation measures:</u> in consultation with the local authorities and communities, inclusion of minimum social security, occupation safety and health standards as per ILO standards will be included when contracting community members and local NGOs/sub-contractors. Employment contracts will be written documents and registered according to the country's labour law and conditions. Lastly, <i>safe spaces</i> for workers' complaints will be established.</p>			
7. Indigenous people	<p><b>Risk: NONE</b></p> <p><u>Evidence:</u> no indigenous people have been identified in target areas. NGOs, municipalities and communities have been consulted (see Annex 4).</p>	<p><b>Risk: NONE</b></p> <p><u>Evidence:</u> national trainings and guidelines will concern climate change adaptation and mitigation, as well as urban resilience. Emphasis will be put on the need to consider marginalised and minority groups.</p>	<p><b>Risk: NONE</b></p> <p><u>Evidence:</u> there is no risk related to the implementation of this component.</p>	NONE
8. Involuntary resettlement	<p><b>Risk: NONE</b></p> <p><u>Evidence:</u> no planned activities in the different sub-projects will determine involuntary resettlement as such. Roads and drainage improvement activities may temporarily disrupt informal vendors. However, this cannot be considered resettlement and vendors will be able to move to nearby suitable locations during the works' period. Participatory planning and involvement of the local residents in decision-making will minimise negative impacts provoked by the sub-projects' works.</p>	<p><b>Risk: NONE</b></p> <p><u>Evidence:</u> activities related to this component do not present any risk of resettlement. Nevertheless, the issue of involuntary resettlement in the context of climate change will be discussed and included in guidelines and training modules.</p>	<p><b>Risk: NONE</b></p> <p><u>Evidence:</u> The activities related to this component do not present any risk of resettlement.</p>	NONE
9. Protection of natural habitats	<p><b>Risk: YES</b> <b>Probability: low</b> <b>Significance: medium</b></p> <p><u>Evidence:</u> even though there are no protected areas as such in the target cities, some sub-projects may have a negative impact on critical natural habitats.</p> <p><u>Mitigation measures:</u> please refer to the ESMP in Table 3.</p>	<p><b>Risk: NONE</b></p> <p><u>Evidence:</u> activities related to this project component do not present any risk since they do not imply any physical interventions.</p>	<p><b>Risk: NONE</b></p> <p><u>Evidence:</u> activities related to this project component do not present any risk since they do not imply any physical interventions.</p>	YES
10. Conserving biodiversity	<p><b>Risk: YES</b> <b>Probability: low</b> <b>Significance: medium</b></p> <p><u>Evidence:</u> As for Principle 9, even though there are no species at risk in the targeted cities, some sub-projects may have a negative impact on areas considered relevant for biodiversity.</p> <p><u>Mitigation measures:</u> please refer to the ESMP in Table 3.</p>	<p><b>Risk: NONE</b></p> <p><u>Evidence:</u> activities related to this project component do not present any risk since they do not imply any physical interventions.</p>	<p><b>Risk: NONE</b></p> <p><u>Evidence:</u> activities related to this project component do not present any risk since they do not imply any physical interventions.</p>	YES
11. Climate change	<p><b>Risk: NONE</b></p> <p><u>Evidence:</u> sub-projects were thoroughly screened for this risk (for more detail, please see Table 2 below) and do not present any</p>	<p><b>Risk: YES</b> <b>Probability: low</b> <b>Significance: low</b></p> <p><u>Evidence:</u> this project component does not include any physical</p>	<p><b>Risk: YES</b> <b>Probability: low</b> <b>Significance: low</b></p> <p><u>Evidence:</u> this project component does not include any physical</p>	YES

	critical source of GHG emissions and will not determine any maladaptation issues.	interventions, hence none of the sectors considered key causes of GHG emissions are involved. However, flights and transportation needed for meetings and missions will result in GHG released. The impact can be considered marginal. <u>Mitigation measures:</u> greening and reforestation sub-projects under Output 1.2 can be considered as mitigation measures through carbon offsetting.	interventions, hence none of the sectors considered key causes of GHG emissions are involved. However, flights and transportation needed for meetings and missions will result in GHG released. The impact can be considered marginal. <u>Mitigation measures:</u> greening and reforestation sub-projects under Output 1.2 can be considered as mitigation measures through carbon offsetting.	
12. Pollution and resource efficiency	<b>Risk: YES</b> <b>Probability: low</b> <b>Significance: medium</b> <u>Evidence:</u> some sub-projects may trigger indirect pollution effects and the risk of over-use of resources (for more detail, please see Table 2 below). No over-use of energy by the sub-projects is foreseen. <u>Mitigation measures:</u> please refer to the ESMP in Table 3.	<b>Risk: NONE</b> <u>Evidence:</u> activities related to this project component do not present any risk under this principle since they do not imply any physical intervention. The only risk is related to GHG emission, already addressed under Principle 11, for which mitigation measures under such a principle apply.	<b>Risk: NONE</b> <u>Evidence:</u> activities related to this project component do not present any risk under this principle since they do not imply any physical intervention. The only risk is related to GHG emission, already addressed under Principle 11, for which mitigation measures under such a principle apply.	YES
13. Public health	<b>Risk: YES</b> <b>Probability: low</b> <b>Significance: high</b> <u>Evidence:</u> some sub-projects may trigger indirect pollution effects with public health implications (for more detail, please see Table 2 below). <u>Mitigation activities:</u> please refer to the ESMP in Table 3.	<b>Risk: NONE</b> <u>Evidence:</u> Considering the guidelines for health assessments of WHO ( <a href="http://www.who.int/hia/evidence/doh/en/index5.html">www.who.int/hia/evidence/doh/en/index5.html</a> ), activities under this component have a positive or neutral effect on issues related to public health.	<b>Risk: NONE</b> <u>Evidence:</u> Considering the guidelines for health assessments of WHO ( <a href="http://www.who.int/hia/evidence/doh/en/index5.html">www.who.int/hia/evidence/doh/en/index5.html</a> ), activities under this component have a positive or neutral effect on issues related to public health.	YES
14. Physical and cultural heritage	<b>Risk: NONE</b> <u>Evidence:</u> No physical and cultural heritage is present in the target sub-projects areas or in their immediate surroundings. Hence, there is no risk.	<b>Risk: NONE</b> <u>Evidence:</u> The activities under this component do not present any risk for heritage, since they do not imply any physical intervention.	<b>Risk: NONE</b> <u>Evidence:</u> The activities under this component do not present any risk for heritage, since they do not imply any physical intervention.	NONE
15. Land and soil erosion	<b>Risk: YES</b> <b>Probability: low</b> <b>Significance: low</b> <u>Evidence:</u> There is valuable land in the target areas which may be impacted negatively by some sub-projects. However, this is a marginal risk as most sub-projects are actually meant to restore degraded land and their dependent ecosystem services. <u>Mitigation activities:</u> please refer to the ESMP in Table 3.	<b>Risk: NONE</b> <u>Evidence:</u> Activities under this component do not present any risk of land degradation since they do not imply any physical interventions.	<b>Risk: NONE</b> <u>Evidence:</u> Activities under this component do not present any risk of land degradation since they do not imply any physical interventions.	YES

## 5. Screening and detailed ESMP for Component 1

As mentioned above, Output 1.2 under Component 1 includes physical interventions to be carried out in the four cities targeted by the project (see sub-project fiches in **Annex 5**). During project preparation some potential risks were identified, however, most are not significant. Project activities are generally small-scale, with few exceptions. The physical interventions will mostly be managed by trained community groups with the support of local authorities and Oxfam International, which will be responsible for executing Component 1. Thanks to this strong community involvement, environmental and social impacts will be minimised. This means that the potential for direct impacts is small and localised, with non-significant indirect impacts, and that transboundary impacts are highly unlikely. Given this, cumulative impacts are also unlikely.

The risk screening for all activities under expected output 1.2 is presented in Table 2 below.

For all risks identified through the screening process, an ESMP was designed and is presented in Table 3.

*Table 2: Risk screening for Expected Output 1.2, Component 1 by groups of sub-projects*

<p><b>Note:</b> The social risk screening and assessment has been carried out for all the different activities within each initiative; for this purpose, initiatives have been grouped by type of similar activities that present the same social and environmental risks. For example, drainage and mobility related initiatives (construction of road, rehabilitation of bridges and channels) have been grouped together, since they entail construction work and the development of infrastructural maintenance plans. In conducting the risk screening, social data and information related to the target communities and to the vulnerable and marginalised groups (see <b>Annex 2</b>) have been taken into consideration and evaluated against the principles. No major risks have been identified. Nevertheless, during the stakeholders' consultations, some level of risk has been highlighted. The concerns refer to factors that may represent or trigger the insurgence of risks of 'non-fully compliance' to the social and environmental principles during the implementation of the planned activities.</p>	
<p><b>Principle 1: Compliance with the Law - Risk: NO</b>  <b>Approach:</b> to assess whether the project will comply with applicable domestic and international law, legal and regulatory frameworks relevant to each sub-project that may require prior permission (such as planning, environmental, construction, water extraction, emissions or production/storage of harmful substances permits) were duly analysed. For each such requirement, the current status, steps already taken and plan to achieve compliance with relevant legislation is outlined in <b>Part II</b> of the proposal, <b>Section F</b>. Based on the detailed evidence for each sub-project, no risk is triggered.</p>	
<p><b>Principle 2: Access and Equity - Risk: YES</b>  <b>Approach:</b> a risk analysis has been undertaken to assess the provision of: (i) fair and impartial active participation by all groups in all planned activities; (ii) equitable access to benefits from all planned activities, in an inclusive manner that does not impede access to any rights and essential services such as basic health, clean water and sanitation, education, housing, safe and decent working conditions and land rights. The same analysis assessed whether the project exacerbates existing inequities, particularly with respect to marginalised or vulnerable groups. The analysis was carried out through surveys during field missions, collecting information and perceptions from local governments, communities and other stakeholders. In conducting the risk screening surveys, social data and information related to the target communities and vulnerable groups (see <b>Annex 2</b>) was gathered, which served as basis for the assessment. The survey results for <b>Moroni, Morondava, Chokwe and Zomba</b> are presented in <b>Annex 2</b>.</p>	
<b>Group</b>	<b>NO</b> (No further assessment required for compliance) <b>or YES</b> (Potential impacts and risks: further assessment required for compliance)
<p><b>1. Drainage and 6. Mobility initiatives</b>  Sub-projects belonging to these thematic areas:  <b>Morondava:</b> 5.1.5; 5.1.6; 5.1.7; <b>Moroni:</b> 5.4.1  <b>Zomba:</b> 5.2.3; 5.2.5; 5.2.6  <b>Chokwe:</b> 5.3.1</p>	<p><b>YES</b>  <b>Evidence:</b> all four cities and related initiatives, construction/rehabilitation and cleaning works (for drainage channels in Morondava, Moroni, Zomba and Chokwe; road and bridges in Morondava and bridges and dam in Zomba) may: i) create temporary physical impediment to the target communities; ii) result in complaints and dissatisfaction; iii) represent a skill development/job opportunity (including cleaning and maintenance of the channels, roads and bridges) that is not accessible by or considered appropriate for all the groups, resulting in discrimination in accessing job opportunities (see also Principle 5); and iv) not take into account local knowledge on building resilient infrastructure. There is also a potential risk that water &amp; sanitation awareness campaigns and related measures may not reach illiterate groups, persons with disabilities and older persons.  <b>WHY RISK COULD NOT BE AVOIDED:</b> the social composition of the target communities makes the risk of non-compliance with the principle a possibility.</p>
<p><b>2. Early warning system (EWS) and 4. Safe havens</b>  Sub-projects belonging to these thematic areas:  <b>Morondava:</b> 5.1.3; 5.1.4  <b>Moroni:</b> 5.4.4  <b>Zomba:</b> 5.2.1; 5.2.2  <b>Chokwe:</b> 5.3.2; 5.3.4</p>	<p><b>YES</b>  <b>Evidence:</b> for the sub-projects under this thematic group there is a risk that community groups are not adequately involved in the initial design and, consequently, EWS do not address the different needs, constraints, capacities and problems through appropriate preparedness plans and special measures in response and pre- and post-emergencies phases. Communication measures and technical tools/systems may not be easily accessible to all community groups.  <b>WHY RISK COULD NOT BE AVOIDED:</b> the social composition of the target communities makes the risk of non-compliance to the principle a possibility.</p>
<p><b>3. Improvement of solid waste management</b>  Sub-projects belonging to the thematic area:  <b>Moroni:</b> 5.4.3  <b>Morondava:</b> 5.1.8  <b>Chokwe:</b> 5.3.3  <b>Zomba:</b> 5.2.4</p>	<p><b>YES</b>  <b>Evidence:</b> for all sub-projects: (i) the creation of the waste committees and awareness initiatives could inadvertently exclude some groups such as young women and migrants, especially in Zomba and Morondava; (ii) the locations selected for installing the waste containers/equipment may fail to address specific needs and recurrent WASH problems resulting in lower access to waste facilities/collection and, consequently, to worsened hygiene practices for some groups; (iii) waste management/drainage maintenance plans may fail to represent a job/training opportunity for all; and (iv) weak coordination among municipal departments (e.g. Social-Waste-Water/WASH) may result in a poorly integrated social approach by the waste management committees vis-à-vis the rest of the community.  <b>WHY RISK COULD NOT BE AVOIDED:</b> the social composition of the target communities makes the risk of non-compliance to the principle a possibility.</p>
<p><b>5. Rehabilitation/ protection of existing ecosystems and sustainable use of natural resources</b>  Sub-projects belonging to these thematic areas:  <b>Moroni:</b> 5.4.2  <b>Morondava:</b> 5.1.1; 5.1.2  <b>Zomba:</b> 5.2.5; 5.2.7</p>	<p><b>YES</b>  <b>Evidence:</b> there is a risk to not sufficiently take into consideration the specific needs and/or to not actively involve specific community groups given traditional habits and stereotypes for women, low-educated people and seasonal migrant families. This may result in: (i) low participation in awareness-raising activities around ecosystem services, water sustainability (Moroni), climate change and livelihoods (Morondava and Zomba); (ii) community conflict around environmental resources usage (rice fields, water management, wood usage and river fishing); and (iii) exclusion/discrimination of particular community groups (e.g. people living with low incomes, women, older persons, children and persons with disabilities) from designing/benefitting from planting activities (mangroves in Morondava and trees in Zomba), green public spaces (Morondava) and rainwater harvesting systems (Moroni).  <b>WHY RISK COULD NOT BE AVOIDED:</b> the social composition of the target communities makes the risk of non-compliance to the principle a possibility.</p>

<b>Principle 3: Marginalised and Vulnerable Groups - Risk: YES</b>	
<p><b>Approach:</b> a risk screening was undertaken to: (i) make sure that the marginalised and vulnerable groups are not excluded from any activities as a consequence of lower motivation, weaker social status, sense of disempowerment and/or lack of skills or knowledge; (ii) to take into consideration their needs/perceptions; and (iii) to avoid imposing any disproportionate adverse impacts on marginalised and vulnerable groups especially children, women and girls, older persons, indigenous people, tribal groups, displaced people, refugees, persons with disabilities, and people living with HIV/AIDS or other vulnerable groups. In conducting the risk screening survey, social data and information related to the target communities and, in particular, the vulnerable and marginalised groups within each community (see <b>Annex 2</b>) was gathered, which served as a basis for the assessment. The survey results for <b>Moroni, Morondava, Chokwe and Zomba</b> are presented in <b>Annex 2</b>.</p>	
Group	<b>NO</b> (No further assessment required for compliance) <b>or YES</b> (Potential impacts and risks: further assessment required for compliance)
<b>1. Drainage and 6. Mobility initiatives</b> Sub-projects: <b>Morondava:</b> 5.1.5; 5.1.6; 5.1.7 <b>Moroni:</b> 5.4.1 <b>Zomba:</b> 5.2.3; 5.2.5; 5.2.6 <b>Chokwe:</b> 5.3.1	<p><b>YES</b></p> <p><u>Evidence:</u></p> <ul style="list-style-type: none"> <li>- <i>Women, children, older persons, persons with disabilities:</i> the perceptions, constraints and needs of those living close to the construction areas may not be prioritised;</li> <li>- <i>Women</i> may experience temporary impediments in accessing informal income-generation activities on the streets (Morondava), activities along the river (Zomba) during construction, rehabilitation and cleaning works (see also Principle 5);</li> <li>- <i>Older persons, children and persons with disabilities:</i> construction and rehabilitation work may temporarily limit their physical movements, impeding access to play grounds (for <i>children</i>) and public facilities such as markets and hospitals (<i>older persons/persons with disabilities</i>);</li> <li>- <i>Unskilled youth:</i> presence of contracted skilled workers for the construction/rehabilitation works may create unbalanced power relationships and dynamics, especially in relation to <i>young women</i> (see also Principle 5).</li> </ul> <p>WHY RISK COULD NOT BE AVOIDED: presence in the target communities of vulnerable and marginalised groups that, given their status, may experience discrimination in taking part in and/or benefitting from these initiatives. Hence, there is a potential risk of non-compliance with this principle.</p>
<b>2. Early warning system and 4. Safe havens</b> Sub-projects: <b>Morondava:</b> 5.1.3; 5.1.4 <b>Moroni:</b> 5.4.4 <b>Zomba:</b> 5.2.1; 5.2.2 <b>Chokwe:</b> 5.3.2; 5.3.4	<p><b>YES</b></p> <p><u>Evidence:</u></p> <ul style="list-style-type: none"> <li>- Early warning systems, action plans and contingency plans may fail in fully recognising the role, constraints, needs and perceptions of <i>women</i> in their role as primary caretakers of the households' assets and custodians of the most vulnerable in the family (<i>children and older persons</i>);</li> <li>- <i>Persons with disabilities, older persons, leprosy survivors</i> (Morondava) <i>and migrants</i> (Morondava and Moroni) are often marginalised and with low educational capacity/skills; as a consequence, they may be excluded from early information and warning systems;</li> <li>- <i>Illiterate and/or low-skilled women, children, persons with disabilities and older persons</i>, given their status and stigma, may be excluded from: (i) the design of the safe havens, especially in terms of accessibility and division of spaces (female/male/family) during emergencies; and (ii) the definition of activities and organisational aspects of the multipurpose centres during non-emergency times;</li> <li>- <i>Seasonal migrant families</i> (Morondava) <i>and individual migrants</i> (Zomba), often not fully integrated in the communities, may not be involved (or may feel themselves not motivated to participate) in community decisions and activities related to the safe havens;</li> <li>- Awareness campaigns and preparedness measures (e.g. emergency simulations) may fail to reach and involve <i>older persons, persons with disabilities and women or female heads of families</i>, who are often illiterate, marginalised and not supported by any community safety net.</li> </ul> <p>WHY RISK COULD NOT BE AVOIDED: presence in the target communities of vulnerable and marginalised groups that, given their status, may experience discrimination in taking part in and benefitting from these initiatives. Hence, there is a potential risk of non-compliance with this principle.</p>
<b>3. Improvement of solid waste management</b> Sub-projects: <b>Moroni:</b> 5.4.3 <b>Morondava:</b> 5.1.8 <b>Chokwe:</b> 5.3.3 <b>Zomba:</b> 5.2.4	<p><b>YES</b></p> <p><u>Evidence:</u> <i>Persons with disabilities and older persons</i> may have problems in accessing waste management facilities and benefitting from improved waste management services. <i>Young mothers/single parents with children</i> may not be consulted on the waste containers resulting in inappropriate locations, especially for <i>children</i>. <i>Unskilled youth</i> may not be prioritised for job opportunities in waste collection. <i>Migrants</i> who are not integrated in the communities may not be consulted and not benefit from waste management training and awareness campaigns. Waste management activities may increase health risks for the communities, especially for <i>children and older persons</i> (see also Principle 13).</p> <p>WHY RISK COULD NOT BE AVOIDED: presence in the target communities of vulnerable and marginalised groups that, given their status, may experience discrimination in taking part in and benefitting from these initiatives. Hence, there is a potential risk of non-compliance with this principle.</p>
<b>5. Rehabilitation/ protection of existing ecosystems and sustainable use of natural resources</b> Sub-projects: <b>Moroni:</b> 5.4.2 <b>Morondava:</b> 5.1.1; 5.1.2 <b>Zomba:</b> 5.2.5; 5.2.7	<p><b>YES</b></p> <p><u>Evidence:</u> In Morondava, <i>poor women/youth</i> working close to the areas where greening activities will be carried out may be negatively affected. <i>Single mothers, female heads of families</i> that are dependent on mangroves for livelihoods may not be adequately: (i) involved in mangroves plantation and maintenance-related works; or (ii) consulted on awareness-raising activities and in identifying sustainable alternative livelihood activities (such as fishing, cooking, heating, etc.). Power relations between local NGO workers (external to the community and employed for mangroves planting) and <i>vulnerable youth, especially young women</i>, may result in social tensions. <i>Seasonal migrant families</i> (Morondava) <i>and individual migrants</i> (Zomba) may be excluded from the mangroves plantation and afforestation activities. <i>Children and youth</i> (especially those not attending school) may be excluded from awareness-raising activities on the importance of maintaining the targeted ecosystems. Green areas (Morondava), afforestation activities (Zomba) and rain water harvesting systems (Moroni) may not be easily accessible for <i>older persons and the disabled</i>.</p> <p>WHY RISK COULD NOT BE AVOIDED: presence in the target communities of vulnerable and marginalised groups that, given their status, may experience discrimination in taking part in and benefitting from these initiatives. Hence, there is a potential risk of non-compliance with this principle.</p>
<b>Principle 4: Human Rights - Risk: NO</b>	

**Approach:** a risk screening was undertaken to assess possible violations of human rights or the raising of human rights issues during sub-projects' implementation. The Human Rights Council special procedures in each target country have been analysed (see **Annex 2**). The screening resulted in no risks of human rights violation or related issues. On the contrary, their implementation represents an opportunity for promoting and advocating the full respect of human rights of all community members. In conducting the risk screening surveys, social data, information and perceptions related to the exercise of the human rights in the target communities and for the vulnerable and marginalised groups was gathered and analysed. Survey results for the 4 cities are presented in **Annex 2**.

### Principle 5: Gender Equality and Women's Empowerment - Risk: YES

**Approach:** a gender-sensitive risk screening was undertaken to make sure that: (i) both women and men have equal opportunities to participate in the different activities; (ii) both women and men equally benefit from the outputs and outcomes of the different initiatives, and women are not disproportionately affected; and (iii) the initiatives do not maintain or exacerbate existing gender inequalities and, on the contrary, represent an opportunity for women's empowerment (see **Annex 2**).

Group	NO (No further assessment required for compliance) or YES (Potential impacts and risks: further assessment required for compliance)
<b>1. Drainage and 6. Mobility initiatives</b> Sub-projects: <b>Morondava:</b> 5.1.5; 5.1.6; 5.1.7; <b>Moroni:</b> 5.4.1; <b>Zomba:</b> 5.2.3; 5.2.5; 5.2.6 <b>Chokwe:</b> 5.3.1	<b>YES</b> <u>Evidence:</u> the final design and construction plans may fail to consider women's' needs and constraints. Construction works may limit women's' ability to access livelihoods and hamper their mobility. Women could be considered as not 'fit' for any construction/maintenance works due to their perceived status, role and/or lack of skills; this would result in failing to promote gender equity and women's empowerment. Awareness campaigns may not reach all women and, as a result, exclude them from a better understanding of the relation between waste, the risks of flooding, sanitation and public health. <b>WHY RISK COULD NOT BE AVOIDED:</b> gender issues related to unequal access to opportunities and resources and often rooted in cultural traditions and/or customary law exist in each of the target communities. This makes the risk of non-compliance with this principle possible.
<b>2. Early warning system (EWS) and 4. Safe havens</b> Sub-projects: <b>Morondava</b> 5.1.3; 5.1.4; <b>Moroni:</b> 5.4.4 <b>Zomba:</b> 5.2.1; 5.2.2 <b>Chokwe:</b> 5.3.2; 5.3.4	<b>YES</b> <u>Evidence:</u> the development of EWS and awareness activities may fail to recognise and take into consideration existing negative gender dynamics, especially gender-based violence (GBV); as a result, this may continue to inadvertently discriminate women and reinforce exclusion mechanisms, especially for stigmatised women as HIV/AIDS victims, GBV survivors or single female heads of the family. The development and design of a safe haven and its management during emergency and normal times may continue to unintentionally discriminate women and/or reinforce existing gender dynamics, especially towards the most vulnerable or stigmatised women such as young single parents, HIV and GBV victims and migrant women. Women's' roles as custodians of the household and responsible for families may prevent them from participating in external activities and events such as community consultations and vocational training. <b>WHY RISK COULD NOT BE AVOIDED:</b> gender issues related to unequal access to opportunities and resources and often rooted in cultural traditions and/or customary law exist in each of the target communities. This makes the risk of non-compliance with this principle possible.
<b>3. Improvement of solid waste management</b> Sub-projects: <b>Moroni:</b> 5.4.3 <b>Morondava:</b> 5.1.8 <b>Chokwe:</b> 5.3.3 <b>Zomba:</b> 5.2.4	<b>YES</b> <u>Evidence:</u> women are responsible for household management and have limited time for other activities. Furthermore, waste is often considered inappropriate for women to handle. This may result in failing to involve them in the RF2 Committees (Morondava) and result in loss of job opportunities for them. Maintenance, sanitation and awareness-raising activities may exclude or not reach less educated and marginalised women. As a result, they may be excluded from a better understanding of the relationship between waste, flooding risks, sanitation and public health. <b>WHY RISK COULD NOT BE AVOIDED:</b> gender issues related to unequal access to opportunities and resources and often rooted in cultural traditions and/or customary law exist in each of the target communities. This makes the risk of non-compliance with this principle possible.
<b>5. Rehabilitation/ protection of existing ecosystems and sustainable use of natural resources</b> Sub-projects: <b>Moroni:</b> 5.4.2 <b>Morondava:</b> 5.1.1; 5.1.2 <b>Zomba:</b> 5.2.5; 5.2.7	<b>YES</b> <u>Evidence:</u> women's opinions (including in their role as mothers of children who will benefit from green spaces) may not be considered sufficiently relevant in the design of these green spaces. Furthermore, given their perceived role and status, they may not be encouraged to participate in awareness-raising activities and to apply for job opportunities related to the maintenance of these green areas. The implementation of the activities may reinforce existing discriminatory practices against women (often representing over 60% of the population) due to their perceived status, role and traditionally unbalanced gender dynamics. This may result in: (i) women not being consulted; (ii) difficulty in taking part in mangroves plantation and maintenance related works; and (iii) not fully benefiting from the outcomes of the activities (fishing/sustainable mangroves management and alternatives livelihood). Ultimately, this would reinforce women's disempowerment. <b>WHY RISK COULD NOT BE AVOIDED:</b> gender issues related to unequal access to opportunities and resources and often rooted in cultural traditions and/or customary law exist in each of the target communities. This makes the risk of non-compliance with this principle possible.

### Principle 6: Core Labour Rights - Risk: YES

**Approach:** a risk screening was undertaken: (i) to assess the labour laws of each country and evaluate if the minimum ILO standards are reflected; and (ii) to make sure that that minimum ILO standards are taken into account during implementation of the planned activities, as appropriate. Hence, compliance of countries to the ILO Conventions on the fundamental principles and rights at work has been analysed and assessed against the national legislation.

Group	NO (No further assessment required for compliance) or YES (Potential impacts and risks: further assessment required for compliance)
<b>1. Drainage and 6. Mobility initiatives</b> Sub-projects: <b>Morondava:</b> 5.1.5; 5.1.6;	<b>YES</b> <u>Evidence:</u> these initiatives entail construction and rehabilitation works so labour contracts will be established in the four countries. Since the national labour laws of Madagascar ( <i>Loi n° 2003-044 - Code du Travail</i> ), Comoros ( <i>Loi 84-108 - Code du Travail</i> ), Mozambique ( <i>Lei do Trabalho</i> N.23/2007) and Malawi (Employment Act, 2000) do not clearly regulate and enforce the ILO standards and principles -especially those related to social security and occupational safety and health- it may result in unfair treatment concerning



5.1.7; <b>Moroni:</b> 5.4.1; <b>Zomba:</b> 5.2.3; 5.2.5; 5.2.6; <b>Chokwe:</b> 5.3.1	compensation (living wage), gender equity, health and security standards in relation to dangerous and unhealthy work. WHY RISK COULD NOT BE AVOIDED: national labour laws do not clearly integrate some of the ILO core principles and rights. Hence, there is a potential risk of non-compliance with this principle.
<b>2. Early warning system and 4. Safe havens</b> Sub-projects: <b>Morondava:</b> 5.1.3; 5.1.4; <b>Moroni:</b> 5.4.4; <b>Zomba:</b> 5.2.1; 5.2.2; <b>Chokwe:</b> 5.3.2; 5.3.4	<b>YES</b> <u>Evidence:</u> these initiatives entail construction works so labour contracts will be established in the four countries. Since the above-referred national labour laws do not clearly regulate and enforce the ILO standards and principles -especially those related to social security and occupational safety and health- it may result in unfair treatment concerning compensation (living wage), gender equity, health and security standards in relation to dangerous and unhealthy work. WHY RISK COULD NOT BE AVOIDED: national labour laws do not clearly integrate some of the ILO core principles and rights. Hence there is a potential risk of non-compliance with this principle.
<b>3. Improvement of solid waste management</b> Sub-projects: <b>Moroni:</b> 5.4.3 <b>Morondava:</b> 5.1.8; <b>Chokwe:</b> 5.3.3; <b>Zomba:</b> 5.2.4	<b>YES</b> <u>Evidence:</u> these initiatives entail construction works so labour contracts will be established in the four countries. Since the above-referred national labour laws do not clearly regulate and enforce the ILO standards and principles -especially those related to social security and occupational safety and health- it may result in unfair treatment concerning compensation (living wage), gender equity, health and security standards in relation to dangerous and unhealthy work. WHY RISK COULD NOT BE AVOIDED: national labour laws do not clearly integrate some of the ILO core principles and rights. Hence there is a potential risk of non-compliance with this principle.
<b>5. Rehabilitation/ protection of existing ecosystems and sustainable use of natural resources</b> Sub-projects: <b>Moroni:</b> 5.4.2; <b>Morondava:</b> 5.1.1; 5.1.2; <b>Zomba:</b> 5.2.5; 5.2.7	<b>YES</b> <u>Evidence:</u> these initiatives entail intensive labour so contracts will be established in the four countries. Since the above-referred national labour laws do not clearly regulate and enforce the ILO standards and principles -especially those related to social security and occupational safety and health- it may result in unfair treatment concerning compensation (living wage), gender equity, health and security standards in relation to dangerous and unhealthy work. WHY RISK COULD NOT BE AVOIDED: national labour laws do not clearly integrate some of the ILO core principles and rights. Hence there is a potential risk of non-compliance with this principle
<b>Principle 7: Indigenous People - Risk: NO</b> <u>Approach:</u> a risk assessment was undertaken to determine whether the planned sub-projects bear any risk in relation to indigenous peoples as in the UN Declaration on the Rights of Indigenous Peoples and other applicable international instruments related to indigenous peoples. Through the risk screening, the presence of indigenous people was checked and it was verified that there are no indigenous peoples in the target areas. Hence, no further assessment is required to demonstrate compliance.	
<b>Principle 8: Involuntary Resettlement - Risk: NO</b> <u>Approach:</u> a risk assessment was undertaken to determine the risk of involuntary resettlement or economic disruption as a consequence of the implementation of planned activities. The risk screening was conducted through local consultations, field missions, expert interviews and mapping of the areas of intervention against the location of households and socio-economic activities. It resulted that none of the planned activities in the different sub-projects will determine involuntary resettlement as such. Roads and drainage improvement works may temporarily disrupt informal vendors. However, this cannot be considered resettlement as such, since vendors will be able to move to nearby suitable locations while the physical works are being implemented. Participatory planning and involvement of the local residents in decision-making will minimise negative impacts provoked by the project works. No further assessment required for compliance.	
<b>Principle 9: Protection of Natural Habitats - Risk: YES</b> <u>Approach:</u> an assessment regarding the presence of protected areas in the four countries was carried out using a set of sources and database such as: UNESCO Man and the Biosphere programme, IUCN website, Environmental Ministries in the four countries, municipal/city departments in charge of the environment, environment-related stakeholders (e.g. NGOs, universities, etc.) in the four cities. The retrieved information was cross-checked through community consultations. Based on the definition of critical natural habitat by the Convention of Biological Diversity, sites were identified and some level of risk exists. More specifically, the identified critical natural habitats in the project areas are: <b>Moroni:</b> the Channel of Mozambique; it does not present a unique or rare ecosystem, but is impacted and degraded by this coastal city due to poor solid and liquid waste management, pollution, etc.; <b>Morondava:</b> the mangroves are protected; they represent a crucial ecosystem for the resilience of the city; the Hellot Channel is part of such an ecosystem; <b>Chokwe:</b> no critical natural habitat has been identified in the project areas; <b>Zomba:</b> the only critical natural habitat identified is the Likangala River with its banks.	
Group	<b>NO</b> (No further assessment required for compliance) <b>or YES</b> (Potential impacts and risks: further assessment required for compliance)
<b>1. Improvement of drainage conditions</b> Sub-projects: <b>Moroni:</b> 5.4.1 <b>Morondava:</b> 5.1.7 <b>Chokwe:</b> 5.3.1 <b>Zomba:</b> 5.2.3	<b>YES</b> <u>Evidence:</u> In <b>Moroni</b> , the drainage network discharges directly into the Channel of Mozambique without passing through a water treatment plant, hence potentially harming the marine ecosystem. The situation is worsened by the waste accumulated in the drainage network and the uncontrolled discharge into the marine ecosystem. In <b>Morondava</b> , similarly to Moroni, the drainage network discharges directly into the Hellot Channel which separates the city from the mangroves, a sensitive critical habitat, before going into the Indian Ocean. The sub-project, by reinforcing the drainage system, would increase the level of discharge of dirty water with waste into the Channel and potentially affect the mangrove area. In <b>Chokwe</b> , as mentioned above, no critical natural habitat has been identified in the project areas.

	<p>In <b>Zomba</b> no protected area or critical natural habitat is present in the project areas; however, the improved drainage system may risk increasing the level of discharge of dirty water with waste into the Likangala River.</p> <p>WHY RISK COULD NOT BE AVOIDED: any drainage intervention would trigger the risk, no matter which project areas are selected. In the case of Moroni, the only way to avoid risk would be to construct a water treatment plant before the water is discharged into the sea. This is a very expensive intervention which would be difficult to justify considering the small scale of the project. The latter is meant to reduce the risk of flooding upstream, in La Coulée neighbourhood. In Morondava and Zomba, the alternative option to avoid the identified risk would be to rebuild the existing drainage system from scratch, which is not financially viable within this project's budget. Again, similarly to Moroni, drainage interventions are very critical to reduce the level of risk of the target population.</p>
<p><b>2. Establishment of early warning systems</b>  Sub-projects: <b>Moroni:</b> 5.4.4  <b>Morondava:</b> 5.1.3; <b>Chokwe:</b> 5.3.4; <b>Zomba:</b> 5.2.1</p>	<p><b>NO</b>  <u>Evidence:</u> despite the presence of the above-mentioned critical natural habitats, the activities under this thematic group do not present any risk for these habitats.</p>
<p><b>3. Improvement of solid waste management (SWM)</b>  Sub-projects: <b>Moroni:</b> 5.4.3  <b>Morondava:</b> 5.1.8; <b>Chokwe:</b> 5.3.3; <b>Zomba:</b> 5.2.4</p>	<p><b>NO</b>  <u>Evidence:</u> the planned SWM interventions are small scale, i.e. no landfill site involved, only containers for temporary collection or sorting/recycling points. These interventions do not threaten any of the identified critical natural habitats in the targeted cities. More specifically:  - In <b>Moroni</b> and <b>Morondava</b>, physical activities only consist of placing containers as waste collection points, not in proximity to any critical natural habitat;  - In <b>Chokwe</b> and <b>Zomba</b>, the construction of sorting/recycling community centres is not planned in proximity of any critical habitat; therefore no risk has been identified.</p>
<p><b>4. Construction of multi-purpose safe havens</b>  Sub-projects: <b>Morondava:</b> 5.1.4; <b>Chokwe:</b> 5.3.2; <b>Zomba:</b> 5.2.2</p>	<p><b>NO</b>  <u>Evidence:</u> the planned interventions under this thematic group are not located within or in proximity of any critical natural habitat.</p>
<p><b>5. Rehabilitation/ protection of existing ecosystems and sustainable use of natural resources</b>  Sub-projects: <b>Moroni:</b> 5.4.2  <b>Morondava:</b> 5.1.1; 5.1.2  <b>Zomba:</b> 5.2.5; 5.2.7</p>	<p><b>YES</b>  <u>Evidence:</u> planned activities related to ecosystem restoration are actually meant to reinforce critical natural habitats, not harming them. The sub-projects under this thematic group concern: (i) water harvesting in <b>Moroni</b>; (ii) mangroves reforestation and creation of a green area in <b>Morondava</b>; and (iii) reforestation and river rehabilitation in <b>Zomba</b>. Only the latter one (sub-project 5.2.5 in Zomba) presents a risk since the planned river rehabilitation involves protecting sections of the river banks with gabions to reduce flooding and erosion. This intervention may affect the health and functioning of the Likangala riverine ecosystem.</p> <p>WHY RISK COULD NOT BE AVOIDED: there are two main ways to reinforcing river banks, which constitutes an absolutely necessary protective measure to reduce risk in the city of Zomba: (i) to build more stable banks; or (ii) to reinforce them through nature-based solutions. The second option requires adequate space and sufficient time, which do not match the present conditions in the site and the urgent requirement to reduce the riverine communities' vulnerability to the effects of floods and erosion. In addition, the most vulnerable sections of the river banks are too steep to create green areas to absorb the impact of floods and creating the needed space for such an intervention would lead to the involuntary resettlement of many community members. Thus, the only viable option is the first one, i.e. to reinforce the river banks using gabions (NB: using concrete would impact even more on the natural habitat of the river banks).</p>
<p><b>6. Improvement of urban mobility through construction and/or rehabilitation of roads and bridges</b>  Sub-projects: <b>Morondava:</b> 5.1.5; 5.1.6; <b>Zomba:</b> 5.2.6</p>	<p><b>NO</b>  <u>Evidence:</u> activities related to mobility focus on the rehabilitation of existing infrastructure, more specifically, a road and three bridges in <b>Morondava</b> and bridges in <b>Zomba</b>. Despite the presence of critical natural habitats in some of the project areas, these sub-projects are not located within or in proximity of these habitats.</p>
<p><b>Principle 10: Conserving Biodiversity - Risk: YES</b>  <u>Approach:</u> to assess if planned project activities trigger any reduction or loss of biological diversity or introduce invasive species, the presence of species at risks or areas of relevant biological diversity were first identified according to the IUCN red list, recognition as a UNESCO Man and the Biosphere reserve or as RAMSAR site (Convention on Wetlands of International Importance). According to the IUCN red list, there are species at risk or there is presence of known biological diversity importance around the four target cities, within an area of 2,000 km<sup>2</sup>. However, based on the UNESCO Man and the Biosphere reserve programme, RAMSAR, local biodiversity maps, consultations with local WWF representatives, the Environmental Ministries in the four countries, municipal/city departments in charge of the environment, environment-related stakeholders (e.g. NGOs, universities, etc.) in the four cities, <u>no species at risk</u> were identified (see <b>Annex 4</b>). This said, some <u>relevant areas in terms of biological diversity</u> were identified and considered in the risk screening per category of sub-projects (see below). The risk of introduction of <u>invasive species</u> was also assessed and found to be negative. The information was cross-checked through community consultations. The only areas of known biological diversity which are relevant to the project are:  <b>Moroni:</b> the Channel of Mozambique; it is not a rare ecosystem and no species at risk characterise it, but it can be considered as part of a fragile coastal ecosystem, according to the Ministry of Environment and the Climate Alliance's experts;  <b>Morondava:</b> the mangroves are not considered a highly important biodiversity area by both the Ministry of Environment and WWF (i.e. no species at risk); however, they are an important ecosystem because rich in terms of flora and fauna according to the municipality and communities. Hence, for the scope of this project, mangroves can be considered relevant for their biodiversity;</p>	

<b>Chokwe:</b> no area of known biological diversity importance has been recorded or reported; <b>Zomba:</b> the area of known biological diversity importance is, again, the Likangala River with its banks, according to the City of Zomba and the consulted Botanic Garden's experts.	
Group	<b>NO</b> (No further assessment required for compliance) or <b>YES</b> (Potential impacts and risks: further assessment required for compliance)
<b>1. Improvement of drainage conditions</b> Sub-projects: <b>Moroni:</b> 5.4.1 <b>Morondava:</b> 5.1.7 <b>Chokwe:</b> 5.3.1 <b>Zomba:</b> 5.2.3	<b>YES</b> <u>Evidence:</u> as mentioned, no species at risk have been identified in any of the target areas. No activity related to drainage networks will harm any species or compromise its movement by interrupting major biodiversity corridors, and no invasive species will be introduced. However, the discharge may represent some risks (related to Principle 9): - In <b>Moroni</b> , by discharging directly into the Channel of Mozambique, the drainage to be built can harm the marine ecosystem and impact on its coastal biodiversity; - In <b>Morondava</b> as well the improved drainage, by discharging directly into the Hellot Channel, may impact on biodiversity because of the mangroves; - In <b>Chokwe</b> no presence of known biological diversity importance has been recorded or reported in the sub-project areas; - In <b>Zomba</b> the improved drainage may discharge dirty water with waste into the Likangala River and impact on the riverine ecosystem, including its flora and fauna. <b>WHY RISK COULD NOT BE AVOIDED:</b> these sub-projects present a risk for biodiversity as consequence of the fact that they present a risk for the critical natural habitat. Thus, the reasons for which risk could not be avoided are the same as the ones presented for this thematic group of sub-projects under Principle 9.
<b>2. Establishment of early warning systems</b> Sub-projects: <b>Moroni:</b> 5.4.4; <b>Morondava:</b> 5.1.3; <b>Chokwe:</b> 5.3.4; <b>Zomba:</b> 5.2.1	<b>NO</b> <u>Evidence:</u> despite the presence of the above-mentioned areas of known biological diversity, the planned activities under this thematic group do not present any risk for the biodiversity since they do not imply any physical interventions and have no impact on the flora and fauna. Hence, there is no loss or degradation of biodiversity and no risk of invasive species.
<b>3. Improvement of solid waste management</b> Sub-projects: <b>Moroni:</b> 5.4.3; <b>Morondava:</b> 5.1.8; <b>Chokwe:</b> 5.3.3; <b>Zomba:</b> 5.2.4	<b>NO</b> <u>Evidence:</u> the planned solid waste management interventions are small scale, i.e. no landfill site involved, only containers for temporary collection or sorting/recycling points. These interventions do not threaten any of the identified critical natural habitats in the targeted cities. This means that no loss or degradation of biological diversity is triggered. There is no introduction of flora or fauna species in the planned activities, hence no risk of invasive species either.
<b>4. Construction of multi-purpose safe havens</b> Sub-projects: <b>Morondava:</b> 5.1.4; <b>Chokwe:</b> 5.3.2; <b>Zomba:</b> 5.2.2	<b>NO</b> <u>Evidence:</u> the planned activities under this thematic group do not present any risk for biodiversity since they do not involve construction in any of the above-identified critical areas. This means that no loss or degradation of biological diversity is triggered, and that there is no risk of invasive species.
<b>5. Rehabilitation/ protection of existing ecosystems and sustainable use of natural resources</b> Sub-projects: <b>Moroni:</b> 5.4.2 <b>Morondava:</b> 5.1.1; 5.1.2 <b>Zomba:</b> 5.2.5; 5.2.7	<b>YES</b> <u>Evidence:</u> the sub-projects under this thematic group are meant to improve conditions for biodiversity. They include: (i) water harvesting in <b>Moroni</b> ; (ii) mangroves reforestation and creation of a green area in <b>Morondava</b> ; and (iii) reforestation and river rehabilitation in <b>Zomba</b> . Only the last one (sub-project 5.2.5 in Zomba) presents a risk of biodiversity reduction since the planned river rehabilitation involves protecting sections of the river banks with gabions to reduce flooding and erosion. This intervention may affect the health and functioning of the Likangala riverine ecosystem. No invasive species will be introduced by the sub-projects under this thematic group. For the sub-projects involving tree planting (5.1.1 and 5.1.2) and reforestation (5.2.7), local experts and authorities will collaborate from the onset to ensure that only indigenous species will be planted. Beside this, no risk of invasive species will be triggered. <b>WHY RISK COULD NOT BE AVOIDED:</b> as explained in Principle 9, sub-project 5.2.5 presents a risk for biodiversity as consequence of the fact that it poses a risk for the critical natural habitat. Thus, the reasons for which risk could not be avoided are the same as the ones presented for this particular sub-project under Principle 9.
<b>6. Improvement of urban mobility through construction and/or rehabilitation of roads and bridges</b> Sub-projects: <b>Morondava:</b> 5.1.5; 5.1.6; <b>Zomba:</b> 5.2.6	<b>NO</b> <u>Evidence:</u> activities related to mobility focus on the rehabilitation of existing infrastructure, more specifically, a road and three bridges in <b>Morondava</b> and bridges in <b>Zomba</b> . Despite the presence of areas of known biological diversity in some of the project areas, these sub-projects are not located within or in proximity of these areas. This means that no loss or degradation of biological diversity is triggered. There is no introduction of flora or fauna species in the planned activities, hence no risk of invasive species. Finally, even though the construction or rehabilitation of a road may not directly harm flora and fauna, it can represent a barrier to the movement of animals and compromise biodiversity corridors. Hence, core biodiversity areas, linkages and biodiversity corridors were checked in Morondava and it is confirmed that the road to be built there will not represent such kind of barrier, hence no risk is identified.
<b>Principle 11: Climate Change - Risk: NO</b> <u>Approach:</u> No planned sub-project will determine maladaptation aspects to climate change. On the contrary, they were all identified and design to increase adaptation and resilience to climate change. according to the IPCC Guidelines for national GHG inventories, relevant sectors/categories to focus on when considering GHG emissions are: (i) energy; (ii) industrial processes (sub-category 'construction') and product uses; (iii) agriculture, forestry and land use; and (iv) waste. The EU (EU, 2014: GHG emissions from waste disposal) considers road transport as an additional sector/category. Based on this classification, when analysing the six thematic groups of sub-projects, the following can be stated: - <b>Drainage</b> (group 1) and <b>safe havens</b> (group 4) can be considered under the "construction" sub-category. Drainage does not involve buildings' construction consuming energy, thus there is no risk of GHG emissions. The envisaged safe-havens are low tech and small scale buildings for which the GHG emissions can be considered negligible. - <b>Early warning systems</b> (group 2) do not fall under any of the above-mentioned categories producing GHG emissions.	



- **Solid waste management** (group 3) falls under the “waste” sector. According to official reporting to the UNFCCC, 95% of GHG emissions result from landfill operations while only 5% of GHG emissions originate from incineration and other treatment operations (composting, recycling, etc.). As mentioned, activities belonging to this thematic group of sub-projects do not consider land fill or incineration, thus they will result in non-relevant GHG emissions. Furthermore, the hectares that will be covered by reforestation and ecosystem rehabilitation activities (thematic group 5) will compensate for these minor emissions.
- **Ecosystem rehabilitation** (group 5) falls under the “forestry” sector. Deforestation, forest degradation and land-use change contribute to 12% of the world's GHG emissions. However, activities under this thematic group will actually improve forests and mangroves through planting. The most important ecosystem service of forests is the absorption of CO<sub>2</sub> produced by burning of fossil fuel through photosynthesis. In addition, wood-fuel collection or timber extraction will be discouraged during project implementation, as explained in the sub-project fiches related to this thematic group by providing alternative livelihood options.
- **Mobility** (group 6) falls under “road transport”. The planned rehabilitation of bridges under this thematic group of sub-projects does not produce buildings consuming energy, thus do not trigger any risk of GHG emissions. Meanwhile the planned roads' rehabilitation contributes only 5-10% of the total transportation-related global GHG emission (equivalent to 13.9%). More specifically, the construction of 15 km of provincial road is equivalent, in terms of emissions, to the construction of 1 km of express road (World Bank, GHG emissions mitigation measures in road construction and rehabilitation). Sub-project 5.1.5 in Morondava relates to the rehabilitation of less than one km of a road that is of a smaller category as compared to a provincial road; the GHG emissions triggered by this sub-project can be considered minor and will be, here too, compensated by the reforestation and ecosystem rehabilitation sub-projects under the thematic group 5.

## Principle 12: Pollution and Resource Efficiency - Risk: YES

**Approach:** planned interventions in this project are all low-tech and do not imply major use of energy or production of waste/pollutants. In addition, all sub-projects are small-scale and to be implemented at the local level, maximising community involvement. Therefore, no risk related to major use of energy or massive production of waste will occur during project implementation. However, some sub-projects involve construction activities that may lead to some level of non-sustainable use of resources. Furthermore, even though no sub-project implies the release of polluting substances, some of them may trigger polluting mechanisms. All risks are described in the table below, which is structured according to the principle itself i.e. risk of overuse of resources and risk of pollution. International standards to minimise the non-sustainable use of resources and prevent pollution will be followed during detailed sub-project design and implementation phases.

Group	NO (No further assessment required for compliance) or YES (Potential impacts and risks: further assessment required for compliance)
<b>1. Improvement of drainage conditions</b> Sub-projects: <b>Moroni:</b> 5.4.1 <b>Morondava:</b> 5.1.7 <b>Chokwe:</b> 5.3.1 <b>Zomba:</b> 5.2.3	<b>YES</b> <b>Evidence:</b> <ul style="list-style-type: none"> <li>➤ <i>Over-use of resources:</i> construction activities under this thematic group of sub-projects may trigger this risk.               <ul style="list-style-type: none"> <li>- <b>Moroni:</b> according to the preliminary design, volcanic rock will be used as building material for drainage construction. Gravels from volcanic rock can be found locally and be used to mix with cement instead of sea-sand according to the municipality, the Ministry of Environment and the community. Therefore, no risk of over-use of resources is foreseen considering that Grand Comore is a purely volcanic island.</li> <li>- <b>Morondava:</b> sand is usually extracted in an uncontrolled manner from the beach and river banks. Dedicated solutions to avoid such a risk will be identified and adopted.</li> <li>- <b>Chokwe:</b> it was agreed with local authorities that building materials will be purchased in Maputo, the capital city (230 km away from Chokwe), from a certified enterprise. The needed soil to build the drainage channels will be obtained through the re-profiling of the ground. Therefore, there is no risk of over-use of resources.</li> <li>- <b>Zomba:</b> sand is usually extracted in an uncontrolled manner from the river banks. Dedicated solutions to avoid such a risk will be identified and adopted.</li> </ul> </li> <li>➤ <i>Pollution:</i> planned activities related to drainage, as mentioned under Principles 9 and 10, may pollute soil and water due to discharge of dirty water with waste.               <ul style="list-style-type: none"> <li>- <b>Moroni:</b> as mentioned earlier, the direct discharge into the Channel of Mozambique may pollute the sea water and the fragile coastal ecosystem due to the presence of waste in the drainage network.</li> <li>- <b>Morondava, Chokwe and Zomba:</b> improvements of the drainage system may cause the direct discharge of dirty water with waste into rivers and sea, thus increase the polluting effect and lowering the water quality of these ecosystems.</li> </ul> </li> </ul> <p>WHY RISK COULD NOT BE AVOIDED: this group of sub-projects presents a risk of over-use of resources because of uncontrolled local practices and lack of environmental policies' enforcement in the construction sector, which need to be addressed. The risk of pollution under this principle is one of the causes of risks under Principles 9 and 10. Thus, the reasons for which risk could not be avoided are the same as those explained for this thematic group of sub-projects under Principle 9.</p>
<b>2. Establishment of early warning systems</b> Sub-projects: <b>Moroni:</b> 5.4.4; <b>Morondava:</b> 5.1.3; <b>Chokwe:</b> 5.3.4; <b>Zomba:</b> 5.2.1	<b>NO</b> <b>Evidence:</b> activities belonging to this thematic group of sub-projects do not imply major use of energy, waste production nor pollution. Therefore, no risk of over-use of resources or of pollution has been identified.
<b>3. Improvement of solid waste management</b> Sub-projects: <b>Moroni:</b> 5.4.3; <b>Morondava:</b> 5.1.8 <b>Chokwe:</b> 5.3.3 <b>Zomba:</b> 5.2.4	<b>YES</b> <b>Evidence:</b> <ul style="list-style-type: none"> <li>➤ <i>Over-use of resources:</i> planned activities under this thematic group of sub-projects in <b>Moroni</b> and <b>Morondava</b> will not lead to any over-use of resources since they only consist of placing some containers to facilitate waste collection. For <b>Chokwe</b> and <b>Zomba</b> the construction of waste sorting/recycling centres leads to potential risks of over-use of resources (sand for concrete) as already presented above under drainage system. However, for Chokwe risks can be excluded because all materials will be obtained from sustainable sources in Maputo while risk is present for Zomba where sand is typically being extracted from the river. However, this is a small scale construction, so there is minor risk.</li> <li>➤ <i>Pollution:</i> even though no landfill intervention is being considered, minor pollution of soil and water may occur in some cities, as follows:               <ul style="list-style-type: none"> <li>- <b>Moroni:</b> the containers will be located over cemented/asphalted roads therefore even if waste dumped outside the containers or waste is not properly collected soil</li> </ul> </li> </ul>

	<p>pollution will be avoided. As there is no presence of ground water in Medina Neighbourhood, where the containers will be located, there is no risk of water pollution;</p> <ul style="list-style-type: none"> <li>- <b>Morondava:</b> there may be minor soil and ground water pollution in case of waste overflow and leakage from the containers, in case of irregular waste collection;</li> <li>- <b>Chokwe and Zomba:</b> community waste sorting/recycling centres are planned; if the ground is not impermeable, leachate may pollute the soil and groundwater.</li> </ul> <p>WHY RISK COULD NOT BE AVOIDED: the risk of over-use of sand from the river banks in Zomba for constructing the community waste centres depends on uncontrolled local practices and lack of policy enforcement; however, as stated above, these are small scale construction activities. With regard to the risk of pollution, this will be minor and will only occur if waste is not properly collected or managed from the containers to be acquired by the project. Concerning the community waste sorting/recycling centres, they will be designed with impermeable ground so that the risk of soil/ground water pollution is minimised.</p>
<b>4. Construction of multi-purpose safe havens</b> Sub-projects: <b>Morondava:</b> 5.1.4 <b>Chokwe:</b> 5.3.2 <b>Zomba:</b> 5.2.2	<p><b>YES</b></p> <p><u>Evidence:</u></p> <ul style="list-style-type: none"> <li>➤ <i>Over-use of resources:</i> sub-projects belonging to this thematic group include construction activities and, similarly to group 1 (drainage improvement), may present some level of risk of over-use of sand only for Morondava and Zomba. However, the construction of safe havens can be considered to be of relatively small scale.</li> <li>➤ <i>Pollution:</i> sub-projects belonging to this thematic group do not present any risk of pollution.</li> </ul> <p>WHY RISK COULD NOT BE AVOIDED: this group of sub-projects presents a risk of over-use of resources because of uncontrolled local practices and lack of environmental policies' enforcement in the construction sector, which need to be addressed.</p>
<b>5. Rehabilitation/ protection of existing ecosystems and sustainable use of natural resources</b> Sub-projects: <b>Moroni:</b> 5.4.2 <b>Morondava:</b> 5.1.1; 5.1.2 <b>Zomba:</b> 5.2.5; 5.2.7	<p><b>NO</b></p> <p><u>Evidence:</u></p> <ul style="list-style-type: none"> <li>➤ <i>Over-use of resources:</i> there is no over-use of resources involved in the planned activities under this group of sub-projects, which are mainly nature-based solutions. Even for the river rehabilitation in Zomba, which plans to use gabions to reduce erosion of the river banks and flood risk, despite being an engineering solution, will not represent a risk of over-use of resources since gabions will be bought from an enterprise. In Zomba there is a branch of LEED (Leadership in Energy and Environmental Design), an internationally recognised green building certification agency that provides third-party verification that a building is designed and constructed according to standards aimed at improving performance across all the metrics that matter most: energy saving, water efficiency, CO<sub>2</sub> emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts. The municipality will request LEED to support this intervention to ensure its maximum sustainability.</li> <li>➤ <i>Pollution:</i> ecosystem rehabilitation/protection activities and the sustainable use of resources will not determine any risk of pollution. No fertilizers or pesticide, which may represent sources of pollution, will be used for the afforestation intervention in Zomba and the rehabilitation of mangroves in Zomba, as per the current community practices. This was decided based on consultation with the communities, representatives from the botanic garden and concerned municipalities and authorities in charge of reforestation in Morondava and Zomba.</li> </ul>
<b>6. Improvement of urban mobility through construction and/or rehabilitation of roads and bridges</b> Sub-projects: <b>Morondava:</b> 5.1.5; 5.1.6; <b>Zomba:</b> 5.2.6	<p><b>YES</b></p> <p><u>Evidence:</u></p> <ul style="list-style-type: none"> <li>➤ <i>Over-use of resources:</i> the rehabilitation of roads and bridges may lead to an over-use of resources, therefore the risk potentially exists.</li> <li>➤ <i>Pollution:</i> since sub-projects under this thematic group refer to the rehabilitation of existing infrastructure and not the construction of new roads and bridges, no increase of traffic will be determined and, thus, no risk of pollution will be triggered.</li> </ul> <p>WHY RISK COULD NOT BE AVOIDED: this group of sub-projects presents a risk of over-use of resources because of uncontrolled local practices and lack of environmental policies' enforcement in the construction sector, which need to be addressed.</p>
<b>Principle 13: Public Health - Risk: YES</b> <p><b>Approach:</b> to assess potential risk of the sub-projects on public health, the screening was done according to the short guide "Focusing on health" (Sweden) listed in the WHO website. The tool is based on a matrix considering determinants of health: democracy, financial security, employment/education, social network, access to health care, belief in the future, physical environment and living habitats (for more information please consult: <a href="http://www.who.int/hia/evidence/doh/en/index5.html">www.who.int/hia/evidence/doh/en/index5.html</a>). Generally speaking, no sub-project presents any risk for <b>democracy</b> or <b>belief in the future</b> since implementation emphasises participation and equity, with special consideration for marginalised and vulnerable groups, gender and freedom of choice. This may hopefully reinforce existing <b>social networks</b>. The sub-projects will not impact negatively on <b>employment</b> or <b>education</b>; on the contrary they will provide job opportunities and capacity building activities. The activities enhance sustainable financial security as well. <b>Access to health care facilities</b> will be enhanced thanks to the roads and bridges improvement works in Morondava and Zomba. These interventions may also positively impact on economic activities; however, ensuring <b>financial security</b> of the target communities is beyond the scope of this project. Risks related to <b>living habitats</b> were already assessed under Principle 9 when referring to natural critical habitats. The only health determinant that may be impacted is the <b>physical environment</b>, meant as safe water, clean air, healthy environment, safe housing, etc. See the table below for more details.</p>	
Group	<b>NO</b> (No further assessment required for compliance) or <b>YES</b> (Potential impacts and risks: further assessment required for compliance)
<b>1. Improvement of drainage conditions</b> Sub-projects: <b>Moroni:</b> 5.4.1; <b>Morondava:</b> 5.1.7; <b>Chokwe:</b> 5.3.1 <b>Zomba:</b> 5.2.3	<p><b>YES</b></p> <p><u>Evidence:</u> as mentioned under Principle 12, the discharge from improved drainage systems in these cities may represent a pollution risk. Even though none of these water bodies represent a drinking source, they are fishing grounds and sources for agricultural irrigation, or places where people play and swim. This implies that the pollution of these water bodies may have a direct or secondary impact on public health.</p> <p>WHY RISK COULD NOT BE AVOIDED: these sub-projects present a risk for public health mainly because of the potential pollution risk as highlighted under Principle 12. Thus, the reasons for which risk could not be avoided are the same as the ones exposed for this thematic group of sub-projects under Principle 12.</p>

<b>2. Establishment of early warning systems</b> Sub-projects: <b>Moroni:</b> 5.4.4; <b>Morondava:</b> 5.1.3; <b>Chokwe:</b> 5.3.4; <b>Zomba:</b> 5.2.1	<b>NO</b> <u>Evidence:</u> this category of sub-projects does not impact on any of the above mentioned determinants and hence does not represent a threat to public health.
<b>3. Improvement of solid waste management (SWM)</b> Sub-projects: <b>Moroni:</b> 5.4.3; <b>Morondava:</b> 5.1.8; <b>Chokwe:</b> 5.3.3; <b>Zomba:</b> 5.2.4	<b>YES</b> <u>Evidence:</u> no exposure to toxic chemicals, industrial wastes, radioactive wastes or health care wastes is triggered by the proposed SWM activities. However, the activities may lead to some level of pollution of the soil and/or ground water (see Principle 12) with direct and indirect impacts on health. If ground water is polluted (as explained under Principle 12, this is a very minor risk) and then consumed as drinking water, it may affect the health of people. In addition, for all cities, in case of irregular waste collection from the installed containers or inefficient management of the waste sorting/recycling centres, waste may attract mosquitos and increasing the risk of malaria or water-borne diseases in case of rainfall among the communities living nearby.  WHY RISK COULD NOT BE AVOIDED: these sub-projects present a risk for public health mainly because of the potential pollution risk as highlighted under Principle 12. Thus, the reasons for which risk could not be avoided are the same as the ones exposed for this thematic group of sub-projects under Principle 12.
<b>4. Construction of multi-purpose safe havens</b> Sub-projects: <b>Morondava:</b> 5.1.4; <b>Chokwe:</b> 5.3.2; <b>Zomba:</b> 5.2.2	<b>NO</b> <u>Evidence:</u> this category of sub-projects does not impact on any of the above mentioned determinants and hence does not represent a threat to public health.
<b>5. Rehabilitation/ protection of existing ecosystems and sustainable use of natural resources</b> Sub-projects: <b>Moroni:</b> 5.4.2 <b>Morondava:</b> 5.1.1; 5.1.2; <b>Zomba:</b> 5.2.5; 5.2.7	<b>YES</b> <u>Evidence:</u> these sub-projects do not impact on any of the above-mentioned determinants and hence do not represent a threat to public health. On the contrary, they will contribute to obtain a safer environment, cleaner air and water, healthier soil, etc. The only potential risk may be represented by the river rehabilitation intervention in <b>Zomba</b> (sub-project 5.2.5) as the use of gabions, if not properly conceived and managed, may harm the natural habitat (see Principle 9 for more details), which is one of the public health determinants.  WHY RISK COULD NOT BE AVOIDED: the river rehabilitation sub-project may present a risk for public health mainly because of its natural habitat dimension among the public health determinants. Thus, the reasons for which risk could not be avoided are the same as the ones exposed for this thematic group of sub-projects under Principles 9 and 10.
<b>6. Improvement of urban mobility through construction and/or rehabilitation of roads and bridges</b> Sub-projects: <b>Morondava:</b> 5.1.5; 5.1.6; <b>Zomba:</b> 5.2.6	<b>NO</b> <u>Evidence:</u> as mentioned, access to health care facilities will be enhanced thanks to the roads and bridges improvement works in Morondava and Zomba. Some level of risk for public health may be represented by possible increase of air pollution or noise due to traffic intensification and increased CO <sub>2</sub> emission. However, since the planned sub-projects do not entail the construction of new infrastructure but the rehabilitation of existing roads and bridges, none of these potential threats will be triggered.

#### Principle 14: Physical and Cultural Heritage - Risk: NO

**Approach:** the presence of physical and cultural heritage sites in the four target cities was mapped. For this purpose, the UNESCO Convention concerning the Protection of World Cultural and Natural Heritage was taken as reference, as well as the UNESCO list of World Heritage Sites and the list of World Heritage in Danger. Buildings and areas recognised as heritage at national or local level were added during this mapping exercise, based on heritage maps provided by the concerned city administrations that were cross-checked during community consultations. The mapping exercise lead to these findings:

- in **Moroni**: no heritage was identified in La Coulée Neighbourhood, while La Medina is indeed considered physical and cultural heritage of Moroni city. Some buildings are already protected by local by-laws, while the process to recognise the entire Medina area as UNESCO World Heritage is underway. The only sub-project concerning La Medina is related to the installation of containers to improve solid waste management in this area (sub-project 5.4.3), which does not represent any risk for existing heritage. In fact, the location of the waste containers will be done in close collaboration with the municipality and the resident community to avoid any impact on heritage.
- in **Morondava, Chokwe and Zomba** no internationally recognised heritage exists. The heritage maps provided by the local administrations show some buildings of recognised value, but none of them will be concerned by the planned activities in the different sub-projects. Therefore, hence there is no risk for physical and cultural heritage in these three cities.

#### Principle 15: Land and Soil Erosion - Risk: YES

**Approach:** for this principle, potential impact of each sub-project was assessed based on two aspects: (i) soil conservation, meant by FAO "avoiding changes in the soil health status resulting in diminished capacity of the ecosystem services provisioning"; and (ii) conservation of valuable lands. For the first aspect, fragile soils were identified based on the knowledge of municipal experts and other institutions dealing with soli/land-related issues; these were, essentially: coastal soil, soil located on steep slopes, rocky areas with very thin soil, areas showing evidence of soil erosion due to lack of water, soil erosion provoked by run-off or deforestation. In the second case, valuable lands were mapped using local/existing knowledge, such as: agricultural land, important land ecosystems for the city's resilience, natural habitats due to their biodiversity or relevance (see Principles 9 and 10). As a result, the following fragile soils and valuable lands were identified in the four cities:

- in **Moroni**: (i) *fragile soils*: coastal soils in La Coulée; steep slopes in La Coulée were not considered fragile soils since they are essentially composed of basaltic rock; (ii) *valuable lands*: the coastal marine ecosystem in La Coulée;
- in **Morondava**: (i) *fragile soils*: none; soils are unstable due to their sandy composition but do not suffer from degradation issues; (ii) *valuable lands*: mangroves and its lagoon/river channels;

- in <b>Chokwe</b> : (i) <i>fragile soils</i> : drainage network banks eroded by water; (ii) <i>valuable lands</i> : agricultural areas; - in <b>Zomba</b> : (i) <i>fragile soils</i> : deforested areas, especially along the slopes of the Zomba Plateau and in the river banks; (ii) <i>valuable lands</i> : agricultural lands, the river and its banks, and the forest areas.	
Group	<b>NO</b> (no further assessment required for compliance) <b>or YES</b> (Potential impacts and risks: further assessment required for compliance)
<b>1. Improvement of drainage conditions</b> Sub-projects: <b>Moroni</b> : 5.4.1 <b>Morondava</b> : 5.1.7 <b>Chokwe</b> : 5.3.1 <b>Zomba</b> : 5.2.3	<b>YES</b> <u>Evidence</u> : - in <b>Moroni</b> : (i) no risk of soil degradation; (ii) as for the valuable lands, the only risk is linked to the marine ecosystem due to uncontrolled discharge of dirty water with waste through the improved drainage system (see Principles 9, 10 and 12); however, this discharge would not directly impact on land but, in a highly diluted manner, only on the sea waters; - in <b>Morondava</b> : (i) no risk of soil degradation because of the sandy soil; (ii) identified valuable lands may be at risk as mentioned under Principles 9, 10 and 12 because of the impact of the uncontrolled discharge of dirty water with waste through the improved drainage system on the mangroves and the Hellot Channel; - in <b>Chokwe</b> : (i) soil degradation is currently observed along the existing drainage channels' banks, hence improvement works should be accompanied by planting vegetation along the banks; (ii) regarding valuable lands, agricultural areas are located outside the city and will not be impacted by the drainage works improvement; - in <b>Zomba</b> : (i) the planned drainage improvement works will not impact on the identified fragile soils; on the contrary, they will reduce the degradation currently observed due to uncontrolled run-off; (ii) as for valuable lands, uncontrolled discharge of dirty water with waste through the improved drainage system (see Principles 9, 10 and 12) may affect the ecosystem functions of the river and its banks.  WHY RISK COULD NOT BE AVOIDED: as mentioned under Principle 9 for this thematic group of sub-projects, any drainage intervention would trigger the risk on the identified valuable lands in Moroni, Morondava and Zomba. Thus, the reasons for which risk could not be avoided are the same as those explained under Principle 9.
<b>2. Establishment of early warning systems</b> Sub-projects: <b>Moroni</b> : 5.4.4 <b>Morondava</b> : 5.1.3; <b>Chokwe</b> : 5.3.4; <b>Zomba</b> : 5.2.1	<b>NO</b> <u>Evidence</u> : sub-projects belonging to this thematic group do not present any risk to fragile soils and valuable lands since they do not involve any physical intervention.
<b>3. Improvement of solid waste management (SWM)</b> Sub-projects: <b>Moroni</b> : 5.4.3 <b>Morondava</b> : 5.1.8; <b>Chokwe</b> : 5.3.3; <b>Zomba</b> : 5.2.4	<b>NO</b> <u>Evidence</u> : SWM activities in the four cities do not take place in any areas characterized by degraded soil or in any areas that can be categorized as "valuable land". In addition, the activity does not cause soil degradation and no land conversion is required.
<b>4. Construction of multi-purpose safe havens</b> Sub-projects: <b>Morondava</b> : 5.1.4; <b>Chokwe</b> : 5.3.2; <b>Zomba</b> : 5.2.2	<b>NO</b> <u>Evidence</u> : the planned safe havens in Morondava, Chokwe and Zomba will not be located on or in proximity of fragile soils or valuable lands; therefore, no risk is identified.
<b>5. Rehabilitation/ protection of existing ecosystems and sustainable use of natural resources</b> Sub-projects: <b>Moroni</b> : 5.4.2; <b>Morondava</b> : 5.1.1; 5.1.2; <b>Zomba</b> : 5.2.5; 5.2.7	<b>YES</b> <u>Evidence</u> : the planned ecosystem rehabilitation interventions are meant to improve the soils' health and will not impact on valuable lands; hence, they will not represent a risk for this principle. However, concerning the river rehabilitation intervention in <b>Zomba</b> (sub-project 5.2.5), the use of gabions may affect the river ecosystem and may, therefore, represent a risk in terms of soil degradation and for the identified valuable lands, i.e. the river itself and its banks.  WHY RISK COULD NOT BE AVOIDED: as mentioned in Principle 9, there are two main ways to reinforcing river banks, which constitutes an absolutely necessary protective measure to reduce risk in the city of Zomba: (i) to build more stable banks; or (ii) to reinforce them through nature-based solutions. Thus, the reasons for which risk could not be avoided are the same as those explained for this thematic group of sub-projects under Principle 9.
<b>6. Improvement of urban mobility through construction and/or rehabilitation of roads and bridges</b> Sub-projects: <b>Morondava</b> : 5.1.5; 5.1.6; <b>Zomba</b> : 5.2.6	<b>NO</b> <u>Evidence</u> : all mobility-related sub-projects do not imply any change of land use or soil degradation: therefore there is no risk.

Based on all risks identified through the screening process (Table 2), a detailed ESMP is presented in Table 3 below. This detailed ESMP is organised by principle and focuses solely on Output 1.2 under Component 1, since the general ESMP for all project components is included in Table 1. Table 3 shows the

results of the risk assessment by highlighting solely the identified risks. In the last two columns, it then proposes the corresponding mitigation measures and monitoring mechanisms. The information presented was corroborated with environmental and social experts and through desk research and missions to the four cities, including field work, surveys and focus group discussions including key community representatives and local stakeholders. Importantly, **this ESMP was presented for public disclosure in each city** (see **Annex 4** for more details) **and results are available online for public information.**

*Table 3: ESMP for Expected Output 1.2, Component 1 by group of sub-projects*

Group	Potential risks impact assessment	Measures to avoid or mitigate potential risks	Monitoring
<b>Principle 2: Access and Equity - Risk: YES</b>			
<b>1. Drainage and 6. Mobility initiatives</b> Sub-projects: <b>Morondava:</b> 5.1.5; 5.1.6; 5.1.7; <b>Moroni:</b> 5.4.1 <b>Zomba:</b> 5.2.3; 5.2.5; 5.2.6 <b>Chokwe:</b> 5.3.1	Construction/rehabilitation and cleaning works may: i) create temporary physical impediment to the target communities; ii) result in complaints and dissatisfaction; iii) represent a skill development/job opportunity that is not accessible by or considered appropriate for all the groups, resulting in discrimination in accessing job opportunities; and iv) not take into account local knowledge on building resilient infrastructure.  There is also a potential risk that water & sanitation awareness campaigns and related measures may not reach illiterate groups, persons with disabilities and older persons.	<ul style="list-style-type: none"> <li>- Final drainage design plans will be presented to the different communities' groups and inputs/perceptions will be integrated in the plans;</li> <li>- Works implementation plan (cleaning, rehabilitation/construction and maintenance) including an indicative timeframe will be presented and discussed openly with the concerned populations; this will include drafting strategies to avoid that the drainage works constitute a physical impediment to the target communities for too long;</li> <li>- Grievance/reporting mechanisms will be set up to capture complaints, feedback, inputs and updates from the concerned communities;</li> <li>- Job descriptions and vacancies for the construction works will be tailored to allow women, youth and other marginalised groups to apply;</li> <li>- Drainage maintenance will be carried out by assigning clear roles/responsibilities between the city and the concerned communities;</li> <li>- Regular awareness-raising activities using images and other audio-visual means.</li> </ul>	<ul style="list-style-type: none"> <li>- Regular meetings with key local stakeholders (communities, local authorities, etc.) during works' implementation (monthly or when needed)</li> <li>- Progress reports</li> <li>- Meetings' attendance lists, minutes and key documents presented/discussed</li> <li>- Grievance reports</li> </ul>
<b>2. Early warning system and 4. Safe havens</b> Sub-projects: <b>Morondava:</b> 5.1.3; 5.1.4; <b>Moroni:</b> 5.4.4 <b>Zomba:</b> 5.2.1; 5.2.2 <b>Chokwe:</b> 5.3.2; 5.3.4	There is a risk that community groups are not adequately involved in the initial design and, consequently, early warning systems (EWS) do not address the different needs, constraints, capacities and problems through appropriate preparedness plans and special measures in response and pre- and post-emergencies phases. Communication measures and technical tools/systems may not be easily accessible to all community groups.	<ul style="list-style-type: none"> <li>- Needs and constraints of the various community groups (especially the most vulnerable) in the target areas will be mapped and profiled;</li> <li>- Grievance/reporting mechanisms will be set up to capture complaints, feedback, inputs and updates from the concerned communities;</li> <li>- Design of the safe havens and evacuation centres will be discussed with all the community groups to integrate their inputs/concerns/suggestions;</li> <li>- Flood EWS and related strategies will be explained and discussed with community representatives, especially those from groups most at risk;</li> <li>- Training sessions on EWS and related simulation exercises using escape routes will be delivered by involving directly community members, especially the most vulnerable, ensuring that they respond to their needs and concerns.</li> </ul>	<ul style="list-style-type: none"> <li>- Regular meetings with key local stakeholders (communities, local authorities, etc.) (monthly or when needed)</li> <li>- Progress reports</li> <li>- Meetings' attendance lists, minutes and key documents presented/discussed</li> <li>- Grievance reports</li> </ul>
<b>3. Improvement of solid waste management (SWM)</b> Sub-projects: <b>Moroni:</b> 5.4.3 <b>Morondava:</b> 5.1.8 <b>Chokwe:</b> 5.3.3 <b>Zomba:</b> 5.2.4	(i) The creation of the waste committees and awareness initiatives could inadvertently exclude some groups such as young women and migrants; (ii) The locations selected for installing the waste containers/equipment may fail to address specific needs and recurrent WASH problems; (iii) Waste management/drainage maintenance plans may fail to represent a job/training opportunity for all; and (iv) Weak coordination among municipal departments may result in a poorly integrated social approach in waste management.	<ul style="list-style-type: none"> <li>- Detailed design and planning related to these interventions will be presented and discussed with all community groups, especially the most vulnerable and marginalised such as women, youth and seasonal migrants;</li> <li>- Grievance/reporting mechanisms will be set up to capture complaints, feedback, inputs and updates from the concerned communities;</li> <li>- WASH needs of these groups will be assessed and findings shared with the relevant municipal departments for integration and creation of synergies;</li> <li>- Job descriptions and vacancies related to community SWM will be tailored to allow women, youth and persons with disabilities to apply.</li> </ul>	<ul style="list-style-type: none"> <li>- Regular meetings with key local stakeholders (monthly or when needed)</li> <li>- Progress reports</li> <li>- Meetings' attendance lists, minutes and key documents presented/discussed</li> <li>- Grievance reports</li> </ul>



<b>5. Rehabilitation/ protection of ecosystems and sustainable use of natural resources</b> Sub-projects: <b>Moroni:</b> 5.4.2 <b>Morondava:</b> 5.1.1; 5.1.2; <b>Zomba:</b> 5.2.5; 5.2.7	<p>There is a risk to not sufficiently take into consideration the specific needs and/or to not actively involve specific community groups given traditional habits and stereotypes for women, low-educated people and seasonal migrant families. This may result in:</p> <p>(i) low participation in awareness-raising activities around ecosystem services, water sustainability, climate change and livelihoods;</p> <p>(ii) community conflict around environmental resources usage; and</p> <p>(iii) exclusion/discrimination of particular community groups from designing/benefitting from planting activities, green public spaces and rainwater harvesting systems.</p>	<ul style="list-style-type: none"> <li>- The detailed design and planning of these sub-projects will be discussed with all concerned community groups, especially the vulnerable and marginalised;</li> <li>- Grievance/reporting mechanisms will be set up to capture complaints, feedback, inputs and updates from the concerned communities;</li> <li>- The direct involvement of these groups will be encouraged, especially through tailored awareness-raising activities;</li> <li>- Job descriptions and vacancies related to these sub-projects will be tailored to allow women, youth and older persons and seasonal migrants to apply;</li> <li>- Alternative livelihood options will be identified to reduce potential conflict on the use of the target environmental resources (mangrove, green spaces, forests, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>- Regular meetings with key local stakeholders (monthly or when needed)</li> <li>- Progress reports</li> <li>- Meetings' attendance lists, minutes and key documents presented/ discussed</li> <li>- Grievance reports</li> </ul>
<b>Principle 3: Marginalised and Vulnerable Groups - Risk: YES</b>			
<b>1. Drainage and 6. Mobility initiatives</b> Sub-projects: <b>Morondava:</b> 5.1.5; 5.1.6; 5.1.7 <b>Moroni:</b> 5.4.1 <b>Zomba:</b> 5.2.3; 5.2.5; 5.2.6 <b>Chokwe:</b> 5.3.1	<ul style="list-style-type: none"> <li>- <i>For women, children, older persons, persons with disabilities:</i> the perceptions, constraints and needs of those living close to the construction areas may not be prioritised;</li> <li>- <i>Women</i> may experience temporary impediments in accessing informal income-generation activities on the streets or along the river during construction, rehabilitation and cleaning works;</li> <li>- <i>Older persons, children and persons with disabilities:</i> construction and rehabilitation work may temporarily limit their physical movements, impeding access to play grounds and public facilities such as markets and hospitals;</li> <li>- <i>Unskilled youth:</i> presence of contracted skilled workers for the construction/rehabilitation works may create unbalanced power relationships and dynamics, especially in relation to <i>young women</i>.</li> </ul>	<ul style="list-style-type: none"> <li>- Community representatives, grass-root organisations, municipal officials, construction companies and other local stakeholders will be sensitised on the importance of capturing the perceptions, constraints and needs of all concerned community groups living close to the construction sites when planning/implementing these initiatives, in particular the marginalised and vulnerable including women, children, older persons and persons with disabilities; this will be done through training and awareness-raising activities;</li> <li>- Safe grievance/reporting mechanisms will be set up to capture complaints, feedback, inputs and updates from the concerned community groups;</li> <li>- Alternative measures for minimising the negative impacts of temporary interruption of informal income-generation activities during construction, rehabilitation and cleaning works will be identified in a participatory manner with the concerned community members under the leadership of local officials;</li> <li>- Alternative access routes for older persons, children and persons with disabilities to access key amenities will be identified and duly communicated;</li> <li>- Job descriptions and vacancies related to these sub-projects will be tailored to allow low-skills and uneducated youth, especially women to apply.</li> </ul>	<ul style="list-style-type: none"> <li>- Regular meetings with key local stakeholders (communities, local authorities, etc.) (monthly or when needed)</li> <li>- Progress reports</li> <li>- Meetings' attendance lists, minutes and key documents presented/ discussed</li> <li>- Grievance reports</li> </ul>
<b>2. Early warning system (EWS) and 4. Safe havens</b> Sub-projects: <b>Morondava:</b> 5.1.3; 5.1.4 <b>Moroni:</b> 5.4.4 <b>Zomba:</b> 5.2.1; 5.2.2 <b>Chokwe:</b> 5.3.2; 5.3.4	<ul style="list-style-type: none"> <li>- EWS and related action/contingency plans may fail in fully recognising the role, constraints, needs and perceptions of <i>women</i>;</li> <li>- Marginalised people like <i>the disabled, older persons, leprosy survivors and migrants</i> may be excluded from EWS;</li> <li>- <i>Illiterate and/or low-skilled women, children, persons with disabilities and older persons</i> may be excluded from: (i) the design of the safe havens; and ii) the definition of activities and organisational aspects of the multipurpose centres during non-emergency times;</li> <li>- <i>Seasonal migrants</i> may not be involved in community decisions and activities related to the safe havens;</li> <li>- Awareness campaigns and preparedness measures may fail to reach and involve <i>older persons, persons with disabilities &amp; women</i>.</li> </ul>	<ul style="list-style-type: none"> <li>- Needs, constraints and capacities of the marginalised and vulnerable groups will be mapped and profiled;</li> <li>- Safe grievance/reporting mechanisms will be set up to capture complaints, feedback, inputs and updates from the concerned community groups;</li> <li>- The detailed design, planning and organisation of EWS and safe-havens will be discussed with all concerned community groups, especially women, the most vulnerable and marginalised;</li> <li>- Simulation exercises involving vulnerable groups will be organised;</li> <li>- Job descriptions and vacancies related to these sub-projects will be tailored to allow seasonal migrants, vulnerable and marginalised to apply;</li> <li>- Awareness raising campaigns and preparedness measures will be designed/ delivered to reach older persons, persons with disabilities and women.</li> </ul>	<ul style="list-style-type: none"> <li>- Regular meetings with key local stakeholders (communities, local authorities, etc.) (monthly or when needed)</li> <li>- Progress reports</li> <li>- Meetings' attendance lists, minutes and key documents presented/ discussed</li> <li>- Grievance reports</li> </ul>
<b>3. Improvement of solid waste management (SWM)</b> Sub-projects: <b>Moroni:</b> 5.4.3 <b>Morondava:</b> 5.1.8 <b>Chokwe:</b> 5.3.3 <b>Zomba:</b> 5.2.4	<ul style="list-style-type: none"> <li>- <i>Persons with disabilities and older persons</i> may have problems in accessing/benefitting from SWM facilities/services;</li> <li>- <i>Young mothers/single parents with children</i> may not be consulted on the waste containers, resulting in inappropriate locations for children;</li> <li>- <i>Unskilled youth</i> may not be prioritised for job opportunities in waste collection;</li> <li>- <i>Migrants</i> may not be consulted and not benefit from waste management training and awareness campaigns;</li> <li>- Waste management activities may increase health risks for the communities, especially for <i>children and older persons</i>.</li> </ul>	<ul style="list-style-type: none"> <li>- Community representatives, grass-root organisations, municipal officials and other local stakeholders, when planning/implementing these initiatives, will be sensitised on the importance of capturing the perceptions, constraints and needs of the marginalised and vulnerable including women, children, older persons and persons with disabilities; this will be done through training and awareness-raising activities, especially to actively involve them in the implementation of waste activities;</li> <li>- Safe grievance/reporting mechanisms will be set up to capture complaints, feedback, inputs and updates from the concerned community groups;</li> <li>- Job descriptions and vacancies related to these sub-projects will be tailored to allow local unskilled youth, migrants, vulnerable and marginalised to apply;</li> <li>- To minimise health risks and safety/security concerns, protective measures for waste related works will be developed and disseminated through appropriate</li> </ul>	<ul style="list-style-type: none"> <li>- Regular meetings with key local stakeholders (communities, local authorities, etc.) (monthly or when needed)</li> <li>- Progress reports</li> <li>- Meetings' attendance lists, minutes and key documents presented/ discussed</li> <li>- Grievance reports</li> </ul>

<b>5. Rehabilitation/ protection of existing ecosystems and sustainable use of natural resources</b> Sub-projects: <b>Moroni:</b> 5.4.2 <b>Morondava:</b> 5.1.1; 5.1.2 <b>Zomba:</b> 5.2.5; 5.2.7	<p>In Morondava, <i>poor women/youth</i> working close to the areas where greening activities will be carried out may be negatively affected. <i>Single mothers, female heads of families</i> that are dependent on mangroves for livelihoods may not be adequately: (i) involved in mangroves plantation and maintenance-related works; or (ii) consulted on awareness-raising activities and in identifying sustainable alternative livelihood activities (such as fishing, cooking, heating, etc.). Power relations between local NGO workers (external to the community) and <i>vulnerable youth, especially young women</i>, may result in social tensions.</p> <p><i>Migrants</i> may be excluded from the mangroves plantation and afforestation activities. <i>Children and youth</i> may be excluded from awareness-raising activities on the importance of maintaining the targeted ecosystems. Green areas, afforestation activities and rain water harvesting systems may not be easily accessible for <i>older persons and the disabled</i>.</p>	<p>channels to reach young mothers, children, older persons, etc.</p> <ul style="list-style-type: none"> <li>- Community representatives, grass-root organisations, municipal officials and other local stakeholders, when planning/implementing these initiatives, will be sensitised on the importance of capturing the perceptions, constraints and needs of the marginalised and vulnerable including women, children, older persons and persons with disabilities; this will be done in a participatory/ consultative way, including through training and awareness-raising activities, especially to actively involve these groups in the planned activities and identify alternative livelihood options;</li> <li>- Safe grievance/reporting mechanisms will be set up to capture complaints, feedback, inputs and updates from the concerned community groups;</li> <li>- Job descriptions and vacancies related to these sub-projects will be tailored to allow local vulnerable youth, especially young women, migrants and other vulnerable/marginalised groups to apply;</li> <li>- Awareness raising campaigns will be designed/delivered to reach children, youth and the marginalised/vulnerable through the use of appropriate platforms, approaches, languages, tools and materials;</li> <li>- Green areas, mangroves conservation and afforestation activities will be designed in a participatory manner to allow access/involvement of the marginalised and vulnerable groups.</li> </ul>	<ul style="list-style-type: none"> <li>- Regular meetings with key local stakeholders (communities, local authorities, etc.) (monthly or when needed)</li> <li>- Progress reports</li> <li>- Meetings' attendance lists, minutes and key documents presented/ discussed</li> <li>- Grievance reports</li> </ul>
<b>Principle 5: Gender Equality and Women's Empowerment - Risk: YES</b>			
<b>1. Drainage and 6. Mobility initiatives</b> Sub-projects: <b>Morondava:</b> 5.1.5; 5.1.6; 5.1.7; <b>Moroni:</b> 5.4.1; <b>Zomba:</b> 5.2.3; 5.2.5; 5.2.6 <b>Chokwe:</b> 5.3.1	<ul style="list-style-type: none"> <li>- The final design and construction plans may fail to consider women's' needs and constraints;</li> <li>- Construction works may limit women's' ability to access livelihoods and hamper their mobility;</li> <li>- Women could be considered as not 'fit' for any construction/ maintenance works due to their perceived status, role and/or lack of skills;</li> <li>- Awareness campaigns may not reach all women and, as a result, exclude them from a better understanding of the relation between waste, the risks of flooding, sanitation and public health.</li> </ul>	<ul style="list-style-type: none"> <li>- Training activities will be delivered to key local stakeholders on women's needs and constraints, especially through existing women's associations;</li> <li>- Consultations and participatory approach on the detailed sub-projects' design and implementation strategies to integrate a gender perspective, minimise negative impacts and actively involve women in the construction works;</li> <li>- Job descriptions and vacancies related to these sub-projects will be gender-sensitive to encourage women's applications;</li> <li>- Safe grievance/reporting mechanisms will be set up to capture women's complaints, feedback, inputs and updates;</li> <li>- Awareness raising campaigns will be designed and delivered in a gender sensitive manner to reach a maximum number of women.</li> </ul>	<ul style="list-style-type: none"> <li>- Regular meetings with key local stakeholders (monthly or when needed)</li> <li>- Progress reports</li> <li>- Meetings' attendance lists, minutes and key documents presented/ discussed</li> <li>- Grievance reports</li> </ul>
<b>2. Early warning system and 4. Safe havens</b> Sub-projects: <b>Morondava:</b> 5.1.3; 5.1.4; <b>Moroni:</b> 5.4.4 <b>Zomba:</b> 5.2.1; 5.2.2 <b>Chokwe:</b> 5.3.2; 5.3.4	<ul style="list-style-type: none"> <li>- EWS and awareness activities may fail to recognise and take into consideration existing negative gender dynamics, especially GBV;</li> <li>- The development and design of a safe haven and its management may continue to unintentionally discriminate women and/or reinforce existing gender dynamics;</li> <li>- Women's' roles as custodians of the household and responsible for families may prevent them from participating in external activities and events such as community consultations and vocational training.</li> </ul>	<ul style="list-style-type: none"> <li>- Existing gender dynamics within the community will be assessed leading to critical recommendations to be integrated in the design of EWS and safe havens;</li> <li>- Women's needs and concerns, especially those of young women, single mothers, women living with HIV/AIDS, GBV victims and female migrants will be integrated in EWS and safe havens design and operationalization/construction;</li> <li>- Safe grievance/reporting mechanisms will be set up to capture women's complaints, feedback, inputs and updates;</li> <li>- Gender will be mainstreamed during community consultations and vocational training, paying special attention in organising these activities according to a time table that respects women's responsibilities within the target communities.</li> </ul>	<ul style="list-style-type: none"> <li>- Regular meetings with key local stakeholders (monthly or when needed)</li> <li>- Progress reports</li> <li>- Meetings' attendance lists, minutes and key documents presented/ discussed</li> <li>- Grievance reports</li> </ul>
<b>3. Improvement of solid waste management</b> Sub-projects: <b>Moroni:</b> 5.4.3 <b>Morondava:</b> 5.1.8 <b>Chokwe:</b> 5.3.3 <b>Zomba:</b> 5.2.4	<p>Women are responsible for household management and have limited time for other activities; waste is often considered inappropriate for them to handle; this may result in failing to involve them in these sub-projects and result in loss of job opportunities for them.</p> <p>Maintenance, sanitation and awareness-raising activities may exclude or not reach less educated and marginalised women; as a result, they may be excluded from a better understanding of the relationship between waste, flooding risks, sanitation and public health.</p>	<ul style="list-style-type: none"> <li>- Existing gender dynamics within the community will be assessed leading to critical recommendations to be integrated in solid waste management (SWM) strategies and trainings;</li> <li>- Specific tasks, roles and responsibilities in SWM will be assigned to women;</li> <li>- Meetings, trainings and awareness raising activities will be held at appropriate times and locations for women, and designed in a gender-sensitive manner;</li> <li>- Safe grievance/reporting mechanisms will be set up to capture women's complaints, feedback, inputs and updates.</li> </ul>	<ul style="list-style-type: none"> <li>- Regular meetings with key local stakeholders (monthly or when needed)</li> <li>- Progress reports</li> <li>- Meetings' attendance lists and minutes</li> <li>- Key documents</li> <li>- Grievance reports</li> </ul>

<b>5. Rehabilitation/ protection of ecosystems and sustainable use of natural resources</b> Sub-projects: <b>Moroni:</b> 5.4.2 <b>Morondava:</b> 5.1.1; 5.1.2; <b>Zomba:</b> 5.2.5; 5.2.7	<ul style="list-style-type: none"> <li>- Women's opinions may not be considered sufficiently relevant in the design of these green spaces;</li> <li>- Women may not be encouraged to participate in awareness-raising activities and to apply for job opportunities related to the maintenance of these green areas;</li> <li>- The implementation of the activities may reinforce existing discriminatory practices against women, which may result in: (i) women not being consulted; (ii) difficulty in taking part in mangroves plantation and maintenance related works; and (iii) not fully benefitting from the outcomes of the activities.</li> </ul>	<ul style="list-style-type: none"> <li>- Communities will be sensitised on the importance of adopting a gender lens and approach in the design and implementation of ecosystem rehabilitation/ protection initiatives; this will be done in a participatory and consultative manner;</li> <li>- Specific tasks during implementation and maintenance of the targeted green areas will be assigned to women; adequate protective measures and job time tables will be applied consequently;</li> <li>- Training and awareness activities will include and be designed according to a gender approach;</li> <li>- Safe grievance/reporting mechanisms will be set up to capture women's complaints, feedback, inputs and updates.</li> </ul>	<ul style="list-style-type: none"> <li>- Regular meetings with key local stakeholders (monthly or when needed)</li> <li>- Progress reports</li> <li>- Meetings' attendance lists, minutes and key documents presented/ discussed</li> <li>- Grievance reports</li> </ul>
<b>Principle 6: Core Labour Rights - Risk: YES</b>			
<b>All sub-projects</b>	<p>These initiatives entail construction works so labour contracts will be established in the four countries. Since national labour laws do not clearly regulate and enforce the ILO standards and principles - especially those related to social security and occupational safety and health- it may result in unfair treatment concerning compensation (living wage), gender equity, health and security standards in relation to dangerous and unhealthy work.</p>	<ul style="list-style-type: none"> <li>- In agreement with the local authorities and concerned communities, minimum social security, occupation safety and health (as per the ILO standards and principles) will be included in labour contracts and sub-contracts;</li> <li>- Employment contracts will be written documents and registered according to the country's labour law and conditions;</li> <li>- Safe grievance/reporting mechanisms will be set up to capture local workers' complaints, feedback, inputs and updates.</li> </ul>	<ul style="list-style-type: none"> <li>- Regular meetings with key local stakeholders (monthly or when needed)</li> <li>- Progress reports</li> <li>- Key documents</li> <li>- Grievance reports</li> </ul>
<b>Principle 9: Protection of Natural Habitats - Risk: YES</b>			
<b>1. Improvement of drainage conditions</b> Sub-projects: <b>Moroni:</b> 5.4.1 <b>Morondava:</b> 5.1.7 <b>Chokwe:</b> 5.3.1 <b>Zomba:</b> 5.2.3	<ul style="list-style-type: none"> <li>- In Moroni, the drainage network discharges directly into the Channel of Mozambique without passing through a water treatment plant, hence potentially harming the marine ecosystem (NB: <u>the impact will be highly diluted</u> considering that the Channel of Mozambique is part of the Indian Ocean);</li> <li>- In Morondava, the drainage network discharges directly into the Hellot Channel which separates the city from the mangroves, a sensitive critical habitat, before going into the Indian Ocean;</li> <li>- In Zomba the improved drainage system may risk increasing the level of discharge of dirty water with waste into the Likangala River.</li> </ul>	<ul style="list-style-type: none"> <li>- Organise awareness-raising activities targeting the concerned local communities to highlight the importance of keeping the drainage ditches clean and the relationship between waste dumping and clogging of ditches, flooding and diseases (see also the Sustainability section of the referred sub-project fiches in <b>Annex 5</b>);</li> <li>- Where appropriate, metal grids can be used to protect drainage ditches to be clogged with waste; in fact, by minimising the storm water pollution the impact on critical habitats will be reduced (NB: this is also linked to sub-projects 5.4.3; 5.1.8 and 5.2.4 on solid waste management);</li> <li>- Monitoring regularly the state of the identified critical natural habitats.</li> </ul>	<ul style="list-style-type: none"> <li>- Monitoring of the identified critical ecosystems at risk every 4 months with local authorities</li> <li>- Monitoring of the state of the drainage channels every 2 months</li> <li>- Meetings' attendance lists and minutes</li> <li>- Progress reports</li> </ul>
<b>5. Rehabilitation/ protection of ecosystems and sustainable use of natural resources</b> Sub-projects: <b>Moroni:</b> 5.4.2; <b>Morondava:</b> 5.1.1; 5.1.2; <b>Zomba:</b> 5.2.5; 5.2.7	<p>Only sub-project 5.2.5 in Zomba presents a risk since the planned river rehabilitation involves protecting sections of the river banks with gabions to reduce flooding and erosion. This intervention may affect the health and functioning of the Likangala riverine ecosystem (NB: <u>the impact will be minimal</u> considering that the Likangala River is 50 km long and that gabions will be installed only in a limited number of spots in Zomba and will not harm the connectivity of the ecosystem).</p>	<ul style="list-style-type: none"> <li>- The design of the river rehabilitation intervention will pay particular attention to ensure that the connectivity of the ecosystem is not affected. The design will be done in collaboration with experts from the Department of Environment of the city council, the Botanic Garden and the University of Malawi in Zomba, in close coordination with the national authorities;</li> <li>- Activities will be organised in collaboration with these entities to protect the riverine ecosystems around the hotspots where gabions will be installed;</li> <li>- Awareness-raising campaigns will be carried out to increase the level of understanding regarding the negative impacts of sand mining in the river banks;</li> <li>- By-laws to prevent informal sand mining in the targeted areas will have to be enforced in a stricter manner, including payment of penalties; involving the riparian populations in this process through awareness-raising and surveillance/reporting mechanisms will be crucial;</li> <li>- Alternative livelihood options will have to be identified for the sand miners.</li> </ul>	<ul style="list-style-type: none"> <li>- Monitoring of the intervention on a regular basis (weekly) during implementation</li> <li>- Monitoring of the state of the river ecosystem and possible impacts by the mentioned entities every 4 months</li> <li>- Meetings' attendance lists and minutes</li> <li>- Progress reports</li> </ul>
<b>Principle 10: Conserving Biodiversity - Risk: YES</b>			



<b>1. Improvement of drainage conditions</b> Sub-projects: <b>Moroni:</b> 5.4.1 <b>Morondava:</b> 5.1.7 <b>Chokwe:</b> 5.3.1 <b>Zomba:</b> 5.2.3	<ul style="list-style-type: none"> <li>- In Moroni, by discharging directly into the Channel of Mozambique, the drainage to be built can harm the marine ecosystem and impact on its coastal biodiversity (NB: <u>the impact will be highly diluted</u> considering that the Channel of Mozambique is part of the Indian Ocean);</li> <li>- In Morondava the improved drainage may impact on biodiversity because of the mangroves, by discharging directly into the Hellot Channel;</li> <li>- In Zomba the improved drainage may discharge dirty water with waste into the Likangala River and impact on the riverine ecosystem, including its flora and fauna (NB: <u>the water quality along the Likangala River today, i.e. before starting the project, varies due to existing pollution points and non-points along the river</u> – see: <a href="https://en.wikipedia.org/wiki/Likangala_River">https://en.wikipedia.org/wiki/Likangala_River</a>)</li> </ul>	<ul style="list-style-type: none"> <li>- Organise awareness-raising activities targeting the concerned local communities to highlight the importance of keeping the drainage ditches clean and the relationship between waste dumping and clogging of ditches, flooding and diseases (see also the Sustainability section of the referred sub-project fiches in <b>Annex 5</b>);</li> <li>- Where appropriate, metal grids can be used to protect drainage ditches to be clogged with waste; in fact, by minimising the storm water pollution the impact on critical habitats will be reduced (NB: this is also linked to sub-projects 5.4.3; 5.1.8 and 5.2.4 on solid waste management);</li> <li>- Monitoring regularly the state of the identified critical natural habitats.</li> </ul>	<ul style="list-style-type: none"> <li>- Monitoring of the identified critical ecosystems at risk every 4 months with local authorities</li> <li>- Monitoring of the state of the drainage channels every 2 months</li> <li>- Meetings' attendance lists and minutes</li> <li>- Progress reports</li> </ul>
<b>5. Rehabilitation/ protection of existing ecosystems and sustainable use of natural resources</b> Sub-projects: <b>Moroni:</b> 5.4.2; <b>Morondava:</b> 5.1.1; 5.1.2; <b>Zomba:</b> 5.2.5; 5.2.7	<p>Only sub-project 5.2.5 in Zomba presents a risk of biodiversity reduction since the planned river rehabilitation involves protecting sections of the river banks with gabions to reduce flooding and erosion. This intervention may affect the biodiversity of the Likangala riverine ecosystem (NB: <u>the impact will be minimal</u> considering that the Likangala River is 50 km long and that gabions will be installed only in a limited number of spots in Zomba).</p>	<ul style="list-style-type: none"> <li>- The design of the river rehabilitation intervention will pay particular attention to ensure that the connectivity of the ecosystem is not affected. The design will be done in collaboration with experts from the Department of Environment of the city council, the Botanic Garden and the University of Malawi in Zomba, in close coordination with the national authorities;</li> <li>- Activities will be organised in collaboration with these entities to protect the riverine ecosystems around the hotspots where gabions will be installed;</li> <li>- Awareness-raising campaigns will be carried out to increase the level of understanding regarding the negative impacts of sand mining in the river banks;</li> <li>- By-laws to prevent informal sand mining in the targeted areas will have to be enforced in a stricter manner, including payment of penalties; involving the riparian populations in this process through awareness-raising and surveillance/reporting mechanisms will be crucial;</li> <li>- Alternative livelihood options will have to be identified for the sand miners.</li> </ul>	<ul style="list-style-type: none"> <li>- Monitoring of the intervention on a regular basis (weekly) during implementation</li> <li>- Monitoring of the state of the river ecosystem by the mentioned entities every 4 months (NB: the existing inventory of species of the Likangala River will serve as baseline)</li> <li>- Meetings' attendance lists and minutes</li> <li>- Progress reports</li> </ul>
<b>Principle 12: Pollution and Resource Efficiency - Risk: YES</b>			
<b>1. Improvement of drainage conditions</b> Sub-projects: <b>Moroni:</b> 5.4.1 <b>Morondava:</b> 5.1.7 <b>Chokwe:</b> 5.3.1 <b>Zomba:</b> 5.2.3	<ul style="list-style-type: none"> <li>➤ <i>Over-use of resources:</i> In Morondava and Zomba sand is usually extracted in an uncontrolled manner from the beach and/or river banks.</li> <li>➤ <i>Pollution:</i> planned activities related to drainage may pollute soil and water due to discharge of dirty water with waste. <ul style="list-style-type: none"> <li>- In Moroni: the direct discharge into the Channel of Mozambique may pollute the sea water and the fragile coastal ecosystem due to the presence of waste in the drainage network (NB: <u>the impact will be highly diluted</u> considering that the Channel of Mozambique is part of the Indian Ocean);</li> <li>- Morondava, Chokwe and Zomba: improvements of the drainage system may cause the direct discharge of dirty water with waste into rivers and sea, thus increase the polluting effect and lowering the water quality of these ecosystems.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- A mitigation plan to avoid over-use of sand in the planned construction activities (and to be rigorously followed) will be drafted for sustainable provisioning of sand before starting the construction phase; the plan will include, among other measures: (i) a detailed design of the drainage channels avoiding the over-use of sand (e.g. substitution of sand with other construction materials); (ii) purchase of sand from non-impacting sources; etc.</li> <li>- To minimise the pollution of surface waters mitigation measures are the same as for Principles 9 and 10 to avoid negative impacts on critical natural habitat and biodiversity.</li> </ul>	<ul style="list-style-type: none"> <li>- Regular (weekly) monitoring of the intervention and adherence to the mitigation plan</li> <li>- Monitoring of the identified ecosystems at risk every 4 months with local authorities</li> <li>- Monitoring of the state of the drainage channels every 2 months</li> <li>- Meetings' attendance lists and minutes</li> <li>- Progress reports</li> </ul>

<b>3. Improvement of solid waste management</b> Sub-projects: <b>Moroni:</b> 5.4.3; <b>Morondava:</b> 5.1.8 <b>Chokwe:</b> 5.3.3 <b>Zomba:</b> 5.2.4	<ul style="list-style-type: none"> <li>➤ <i>Over-use of resources:</i> For Zomba the construction of waste sorting/recycling centres leads to potential risks of over-use of resources (sand for concrete). However, this is a <u>small scale construction</u>, so there is minor risk.</li> <li>➤ <i>Pollution:</i> minor pollution of soil and water may occur in some cities, as follows: <ul style="list-style-type: none"> <li>- Morondava: there may be minor soil and ground water pollution in case of waste overflow and leakage from the containers, in case of irregular waste collection;</li> <li>- Chokwe and Zomba: community waste sorting/recycling centres are planned; if the ground is not impermeable, leachate may pollute the soil and groundwater.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- Similarly to the drainage thematic group of sub-projects, a mitigation plan to avoid over-use of sand in the planned construction activities will be drafted for sustainable provisioning of sand before starting the construction phase;</li> <li>- To minimise the risk of pollution there is need to include a waterproof ground (e.g. using cement or underground plastic sheet) during the design phase to avoid leachate percolation that may affect the soil or ground water quality;</li> <li>- Ensuring timely and regular collection of waste by the local authorities in collaboration with the concerned communities will be crucial; awareness-raising activities will also be carried out for this purpose;</li> <li>- See more mitigation measures under the Sustainability section of the referred sub-project fiches in <b>Annex 5</b></li> </ul>	<ul style="list-style-type: none"> <li>- Weekly monitoring of the intervention during construction and waste collection</li> <li>- Sub-projects' detailed design plans</li> <li>- Monitoring of the state of soil and ground water every 6 months with local authorities</li> <li>- Meetings' attendance lists and minutes</li> <li>- Progress reports</li> </ul>
<b>4. Construction of multi-purpose safe havens</b> Sub-projects: <b>Morondava:</b> 5.1.4 <b>Chokwe:</b> 5.3.2 <b>Zomba:</b> 5.2.2	Sub-projects belonging to this thematic group include construction activities and, similarly to group 1 (drainage improvement), may present some level of risk of over-use of sand only for Morondava and Zomba. However, the construction of safe havens can be considered to be of relatively <u>small scale</u> .	Similarly to the drainage thematic group of sub-projects, a mitigation plan to avoid over-use of sand in the planned construction activities will be drafted for sustainable provisioning of sand before starting the construction phase.	<ul style="list-style-type: none"> <li>- Regular monitoring (weekly) of the intervention and adherence to the mitigation plan during the construction phase</li> <li>- Progress reports</li> </ul>
<b>6. Improvement of urban mobility through construction/rehabilitation of roads &amp; bridges</b> Sub-projects: <b>Morondava:</b> 5.1.5; 5.1.6; <b>Zomba:</b> 5.2.6	The rehabilitation of roads and bridges may lead to an over-use of resources.	Similarly to the drainage thematic group of sub-projects, a mitigation plan to avoid over-use of sand in the planned construction activities will be drafted for sustainable provisioning of sand before starting the construction phase.	<ul style="list-style-type: none"> <li>- Regular monitoring (weekly) of the intervention and adherence to the mitigation plan during the construction phase</li> <li>- Progress reports</li> </ul>
<b>Principle 13: Public Health - Risk: YES</b>			
<b>1. Improvement of drainage conditions</b> Sub-projects: <b>Moroni:</b> 5.4.1 <b>Morondava:</b> 5.1.7 <b>Chokwe:</b> 5.3.1 <b>Zomba:</b> 5.2.3	As mentioned in Principle 12, the discharge from improved drainage systems may represent a pollution risk. Even though none of these water bodies represent a drinking source, they are fishing grounds and sources for agricultural irrigation, or places where people play and swim. This implies that the pollution of these water bodies may have a direct or secondary impact on public health.	As impacts on public health depend on potential water pollution, the mitigation measures to be applied are the same as for Principle 9, 10 and 12 (2 <sup>nd</sup> bullet related to pollution) for this thematic group of sub-projects.	<ul style="list-style-type: none"> <li>- Monitoring of the identified ecosystems at risk every 4 months</li> <li>- Monitoring of the state of the drainage channels every 2 months</li> <li>- Meetings' attendance lists and minutes</li> <li>- Progress reports</li> </ul>
<b>3. Improvement of solid waste management</b> Sub-projects: <b>Moroni:</b> 5.4.3; <b>Morondava:</b> 5.1.8 <b>Chokwe:</b> 5.3.3 <b>Zomba:</b> 5.2.4	The planned activities may lead to some level of pollution of the soil and/or ground water (see Principle 12) with direct and indirect impacts on health. If ground water is polluted (as explained under Principle 12, this is a <u>very minor risk</u> ) and then consumed as drinking water, it may affect the health of people. In addition, for all cities, in case of irregular waste collection from the installed containers or inefficient management of the waste sorting/recycling centres, waste may attract mosquitos and increasing the risk of malaria or water-borne diseases in case of rainfall among the communities living nearby.	<ul style="list-style-type: none"> <li>- To minimise the risk of ground water pollution there is need to include a waterproof ground (e.g. using cement or underground plastic sheet) during the design phase to avoid leachate percolation;</li> <li>- Ensuring timely and regular collection of waste by the local authorities in collaboration with the concerned communities will be crucial; awareness-raising activities will also be carried out for this purpose;</li> <li>- See more mitigation measures under the Sustainability section of the referred sub-project fiches in <b>Annex 5</b>.</li> </ul>	<ul style="list-style-type: none"> <li>- Weekly monitoring of waste collection</li> <li>- Sub-projects' detailed design plans</li> <li>- Monitoring of the state of soil and ground water every 6 months with local authorities</li> <li>- Meetings' attendance lists and minutes</li> <li>- Progress reports</li> </ul>

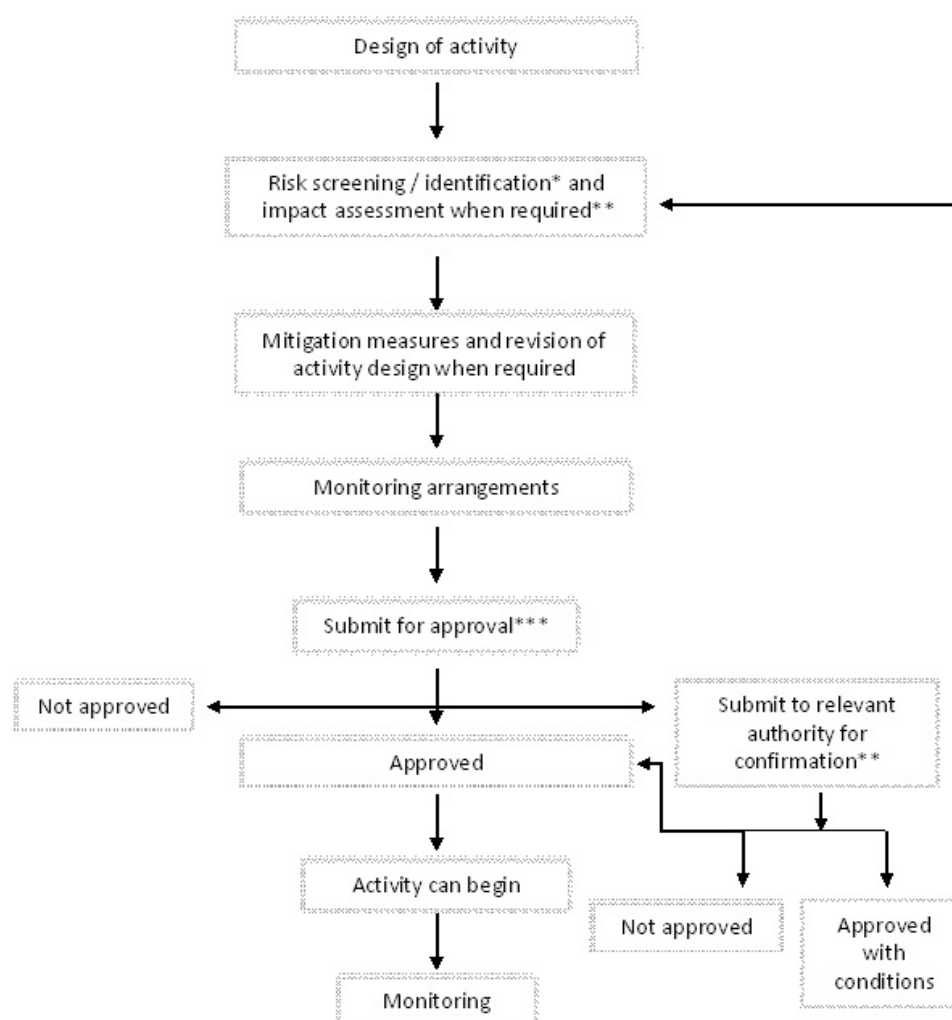
<b>5. Rehabilitation/ protection of ecosystems and sust. use of natural resources</b> Sub-projects: <b>Moroni:</b> 5.4.2; <b>Morondava:</b> 5.1.1; 5.1.2; <b>Zomba:</b> 5.2.5; 5.2.7	The only potential risk may be represented by the river rehabilitation intervention in Zomba (sub-project 5.2.5) as the use of gabions, if not properly conceived and managed, may harm the natural habitat, which is one of the public health determinants.	As impacts on public health depend on the quality of the Likangala River, the mitigation measures to be applied are the same as for Principle 9 (1 <sup>st</sup> and 2 <sup>nd</sup> bullets) for this thematic group of sub-projects.	<ul style="list-style-type: none"> <li>- Weekly monitoring of the intervention during implementation</li> <li>- Monitoring of the state of the river ecosystem every 4 months</li> <li>- Meetings' attendance lists and minutes</li> <li>- Progress reports</li> </ul>
<b>Principle 15: Land and Soil Erosion - Risk: YES</b>			
<b>1. Improvement of drainage conditions</b> Sub-projects: <b>Moroni:</b> 5.4.1 <b>Morondava:</b> 5.1.7 <b>Chokwe:</b> 5.3.1 <b>Zomba:</b> 5.2.3	<ul style="list-style-type: none"> <li>- in Moroni: some level of risk associated to the marine ecosystem due to uncontrolled discharge of dirty water with waste through the improved drainage system; this discharge impact, <u>in a highly diluted manner</u>, only on the sea waters;</li> <li>- in Morondava: identified valuable lands may be at risk because of the impact of the uncontrolled discharge of dirty water with waste through the improved drainage system on the mangroves and the Hellot Channel;</li> <li>- in Chokwe: soil degradation is currently observed along the existing drainage channels' banks;</li> <li>- in Zomba: uncontrolled discharge of dirty water with waste through the improved drainage system may affect the ecosystem functions of the river and its banks.</li> </ul>	<ul style="list-style-type: none"> <li>- To minimise the degradation of the identified valuable lands and avoid any negative impact on ecosystem services provisioning due to water pollution as described in the risk assessment, the mitigation measures to be adopted are the same as under Principles 9 and 10 (2nd bullet) for this thematic group of sub-projects;</li> <li>- Drainage improvement works in Chokwe will be accompanied by planting vegetation activities along the banks to reduce soil degradation</li> <li>- See more mitigation measures under the Sustainability section of the referred sub-project fiches in <b>Annex 5</b>.</li> </ul>	<ul style="list-style-type: none"> <li>- Monitoring of the identified ecosystems at risk every 4 months</li> <li>- Monitoring of the state of the drainage channels every 2 months</li> <li>- Meetings' attendance lists and minutes</li> <li>- Progress reports</li> </ul>
<b>5. Rehabilitation/ protection of ecosystems and sust. use of natural resources</b> Sub-projects: <b>Moroni:</b> 5.4.2; <b>Morondava:</b> 5.1.1; 5.1.2; <b>Zomba:</b> 5.2.5; 5.2.7	Only the river rehabilitation intervention in Zomba (sub-project 5.2.5) including the use of gabions may affect the river ecosystem and may, therefore, represent a risk in terms of soil degradation and for the identified valuable lands, i.e. the river itself and its banks.	The same mitigation measures proposed under Principles 9, 10, 12 and 13 proposed for this thematic group of sub-projects may be applied.	<ul style="list-style-type: none"> <li>- Weekly monitoring of the intervention during implementation</li> <li>- Monitoring of the state of the river ecosystem every 4 months</li> <li>- Meetings' attendance lists and minutes</li> <li>- Progress reports</li> </ul>

## 6. Arrangements to implement the ESMP

The combination of the screening and the ESMP lists all potential risks identified, and the mitigation measures proposed to reduce potentially adverse environmental and social impacts to acceptable levels. The plan shows how these potential risks and mitigation measures will be further monitored, including responsibilities.

The measures put in-place to ensure compliance with the ESMP and the overall management of environmental and social risks is detailed in **Part III, Section C** of the main body of the proposal. This section provides information on risks management arrangements, risks monitoring and evaluation arrangements, and the grievance mechanisms.

*Figure 1: screening safeguarding procedure when changes in activities or additional activities are required during the project*



\* For all activities against the 15 ESP principles.  
Use of Risk Assessment Sheet where necessary

\*\* In consultation with Project Supervision Team

\*\*\* All after activities to be approved by Project Management Committee

Sub-project risks screening questionnaire when changes in activities or additional activities are required during the project; steps:

1. Please fill out Tables 1 & 2 to provide the specific details for each activity / sub project;
2. Complete the checklist (Table 3), to assess the potential risk areas;
3. Identify risks mitigation measures for the questions answered 'yes' by filling Table 4;
4. Sign off the project for submission to approving authority (Table 5).

**TABLE 1: GENERAL INFORMATION**

1. Activity / Sub-Project title	
2. Project number (if relevant)	
3. Project location (village, districts, geographical coordination)	
4. Person who filled the form	
5. Date of screening	
6. Signature	

**TABLE 2: ACTIVITY / SUB-PROJECT DETAILS**

**TECHNICAL INFORMATION (WHAT WILL BE DEVELOPED / CONSTRUCTED + DETAILS: LOCATION, LENGTH, SIZE, ETC.)**

7. Activity description and or asset to be developed	Mention relevant details, including length, size, etc.
8. Materials to be used	(Estimation of) type and quantity needed for construction and / or enhancement of ecosystems (where applicable)
9. Other technical specifications	Add any relevant information from an environmental point of view, e.g. what type of terrain (where applicable)
10. Who owns the land the activity is planned on and / or who uses the land and why?	Is the land public, private, etc.? Is land use legal / illegal? What is the land used for? Can land users be compensated? If so, how?
11. Start date of activity / works	
12. End date of activity / works	

**USE OF ASSETS (BENEFITS AND ACCESS)**

13. How will the asset be used	What kind of use is planned for the asset? What benefits are expected? How will they will be distributed (equally) and who will use it (women, men, young people, minorities, etc.)?
14. Interventions required for appropriate use of the asset	List any other activity planned to ensure the asset is used as it should be; e.g. training and capacity building, sensitisation, accompanying measures like soil erosion management, drainage, quota systems, etc.
15. Interventions required for sustainable management and maintenance	What kind of maintenance will be needed? Who will be responsible and who will do it? How will the asset be managed? And by whom?

**CONSULTATIONS**

16. Was the community (and specific groups) consulted	Yes or no and comment / outcome (any specific needs for specific groups)
17. Have relevant local authorities been consulted	Yes or no and comment / outcome (any specific needs / suggestions)

**ENVIRONMENTAL AND SOCIAL CONTEXT**

18. Description of the environmental context and the main environmental issues on the site / in the area	Give a short description of the environmental situation on the site and in the area and mention the main environmental issues (e.g.: presence of specific biodiversity; deforestation, soil fertility loss, water scarcity, lack of groundwater, water quality degradation, waste issues, etc.). The description should contain essential information on which of the risks identification (see below) is based.
19. Description of the social context and the main social issues on the site / in the area	Example: What groups live in target area? Land tenure conflicts, land ownership and use, high incidence of malaria or other diseases, recurrent conflicts between inhabitants, high number of indigenous people, etc. The description should contain essential information on which the risks identification (see below) is based
20. Is an ESIA required by law?	Comment

**TABLE 3: CHECKLIST OF POTENTIAL RISK AREAS OF NON-COMPLIANCE WITHIN THE ADAPTATION FUND'S ENVIRONMENTAL AND SOCIAL PRINCIPLES**

**ANSWER  
(Y/N)**

**Principle 1: Compliance with the Law**

20 Is there a risk that the activity does not comply with an applicable domestic or international law? Is an ESIA	
---	--

required by national law? Check for what projects and size ESIAs are required and possibly discuss with municipality or ministry. What is the process and who is responsible?	
<b>Principle 2: Access and Equity</b>	
21. Is there a risk that the activity would exclude any potentially affected stakeholders from fully participating in decisions that may affect them?	
22. Is there a risk that the activity would impede access of any group to basic health services, clean water and sanitation, energy, education, housing, safe and decent working conditions, land rights, etc.?	
23. Is there a risk that the activity does not provide fair and equitable access to benefits from the project to all affected stakeholders?	
24. Is there a risk that the activity exacerbates existing inequities, particularly with respect to marginalized or vulnerable groups?	
<b>Principle 3: Vulnerable and Marginalised Groups</b>	
25. Are there any marginalised or vulnerable groups present among project beneficiaries?	
26. Is there likelihood that the activity would have inequitable or discriminatory adverse impacts on affected populations, particularly people living in poverty or marginalised or excluded individuals or groups?	
27. Could the activity potentially restrict availability, quality of and access to resources or basic services to marginalised individuals or groups?	
<b>Principle 4: Human Rights</b>	
28. Could the activity lead to adverse impacts on enjoyment of the human rights (civil, political, economic, social or cultural) of the affected population?	
29. Would the activity possibly affect land tenure arrangements and/or community based property rights/customary rights to land, territories and/or resources?	
<b>Principle 5: Gender Equality and Women's Empowerment</b>	
30. Is there likelihood that the proposed activity would have adverse impacts on gender equality and/or the situation of women and girls?	
31. Would the activity potentially reproduce discriminations against women based on gender, especially regarding participation in design and implementation or access to opportunities and benefits?	
32. Would the activity potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and positions of women and men in accessing environmental goods and services?	
<b>Principle 6: Core Labour Rights</b>	
33. Does the activity involve support for employment or livelihoods that may fail to comply with national and international labour standards (i.e. principles and standards of ILO fundamental conventions)?	
<b>Principle 7: Indigenous People</b>	
34. Are indigenous peoples present in the project area?	
35. Would the proposed activity potentially affect the human rights, lands, natural resources, territories, and traditional livelihoods of indigenous peoples?	
36. Would the activity adversely affect the development priorities of indigenous peoples as defined by them?	
37. Has there been an absence of culturally appropriate consultations on matters that may affect the rights and interests, lands, resources, territories and traditional livelihoods of the indigenous peoples concerned?	
<b>Principle 8: Involuntary Resettlement</b>	
38. Would the activity potentially involve temporary or permanent and full or partial physical displacement?	
39. Is there a risk that the activity would lead to forced evictions?	
40. Will the activity lead to economic displacement (loss of assets or access to assets that leads to loss of income sources or other means of livelihood)?	
<b>Principle 9: Protection of Natural Habitats</b>	
41. Is the activity within or adjacent to critical habitats and/or environmentally sensitive areas, including legally protected areas (e.g. nature reserve, national park), areas proposed for protection, or recognized as such by authoritative sources and/or indigenous peoples or local communities?	
42. Would the activity potentially cause adverse impacts to habitats (e.g. natural, modified, and critical habitats) and/or ecosystems and ecosystem services?	
43. Does the activity involve changes to the use of lands and resources that may have adverse impacts on habitats, ecosystems, and/or livelihoods?	
<b>Principle 10: Conserving Biodiversity</b>	
44. Could the activity lead to the reduction or loss of biological diversity?	
45. Would the activity pose a risk of introducing invasive and/or non-native species?	
46. Is monoculture foreseen?	
47. Would the activity pose risks to endangered species?	
<b>Principle 11: Climate Change</b>	
48. Will the activity result in significant greenhouse gas emissions or may it exacerbate climate change / maladaptation (e.g. negative effects in other areas)?	
<b>Principle 12: Pollution and Resource Efficiency</b>	
49. Does the activity require significant consumption of raw materials, energy, and/or water?	
50. Would the activity potentially result in the generation of waste (both hazardous and non-hazardous)?	



51. Would the activity potentially result in the release of pollutants to the environment due to routine or non-routine circumstances with the potential for adverse local, regional, and/or transboundary impacts?	
52. Will the activity involve the application of pesticides?	
<b>Principle 13: Public Health</b>	
53. Would the activity result in potential increased health risks (e.g. from waterborne or other vector-borne diseases or communicable infections such as HIV/AIDS)?	
54. Would the activity pose potential risks to community health and safety due to the transport, storage, and use and/or disposal of hazardous or dangerous materials?	
55. Would elements of activity construction, operation, or decommissioning pose potential safety risks to local communities?	
<b>Principle 14: Physical and Cultural Heritage</b>	
56. Will the proposed activity result in interventions that would potentially adversely impact sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g. knowledge, innovations, practices)?	
<b>Principle 15: Land and Soil Erosion</b>	
57. Will the activity lead to the conversion of wetlands, waterways, or woodlots?	
58. Will the activity cause the clearing of natural vegetation and/or forest?	
59. Is there a risk that the activity leads to soil degradation?	
60. Is there a risk that the activity is designed without proper soil analysis and/or does not match soil capability?	

TABLE 5: SIGN OFF FOR SUBMISSION FOR APPROVAL		
Signature	Date	Description
Assessor of activity sub-project		
Project leader		
UN-Habitat Project Manager		

## Annex 4 – CONSULTATION DETAILS

### ➤ Madagascar

In Morondava, the consultation process involved local authorities (regional, district, municipal, neighbourhood level), municipal technical staff, communities most affected by risks and climate change and civil society organisations (see the following link for more information about consultations in Morondava: <http://dimsur.org/annex-4-local-consultations-and-support-letter-to-esmp-in-morondava-madagascar/>). Overall, during the elaboration and adoption of the City Resilience Action Plan of Morondava using the CityRAP Tool, 124 persons directly participated in the data collection and identification of priority actions. Two workshops were organised for such a purpose:

- 15 March 2016: prioritisation workshop during which 10 priority issues in the short-, medium- and long-term were selected with the participation of 26 representatives of local stakeholders, including communities and municipal staff.
- 15-17 March 2016: validation workshop, during which 23 participants validated the priority issues and activities identified in the City Resilience Action Plan of Morondava prepared by the team of municipal focal points with the support of UN-Habitat.

An assessment of the proposed project activities at the concept note stage took place in Morondava in the form of a stakeholder consultation on 6 December 2016 with 20 representatives from the Menabe Region, the Morondava municipality, the fokontany (neighbourhoods) of Ampasy, Avaradrova, Sans fil and Tanambao, the technical services of the Ministry, the Morondava Women's and Youth Association, journalists and the local development and risk management committees. The associations dealing with environmental issues were represented by the Deputy Mayor of Morondava. The participants approved the proposed activities to be carried out in the project. As important points validated were the consideration of gender and the participation of young people. It was further proposed that journalists should be involved in activities for transparency, and that existing studies within the municipality on environmental aspects should be taken into account. The activities foreseen in the concept note were also approved at the level of fokontany chiefs. It was found that the activities would improve the current living conditions (more decent and safer, thus offering alternative solutions to all forms of housing relocation). An additional priority for Morondava city would be reforestation actions with fast-growing and drought-resistant species to meet the growing need for energy.

In-depth local consultations took place between 26 and 30 June 2017. Additional ministerial level consultations to further detail activities under Component 3 took place in July 2017. Then, from 23-26 October 2017, project site visits and further local consultations took place with a view to assessing the feasibility and social and environmental risks of the planned project activities. The table below gives an overview of these consultations and summarises the outcomes.

*Table 1: Overview of consultations carried out in Morondava from 23-26 October 2017*

Stakeholder, incl. role / function	Consultation objective	Outcome	Conclusion
<b>Morondava city level</b>			
City council: Mayor, Deputy Mayor, Focal Points of the CityRAP process	Acquire required detail to fill environmental and social risk screening sheets and agree on interventions	Filled environmental and social risk screening sheets, agreement on interventions and understanding of grievance mechanism that can work in Morondava	City council fully supported the mission (with technical specialist made available for the full week). They proposed that grievance mechanisms should be done through radio, based on what already exist but should be improved. It was recommended to raise this issue during community consultations.
Meeting with the Focal Point of the "Sustainable management of coastal areas to face climate change" project	Gain understanding of the project to be initiated early next year and check potential overlaps	Relevant information collected concerning the project and discussion about	The project will focus on the stabilization and replanting of dunes; therefore, it was decided that the interventions of this proposal should focus on other complementary areas. Also, two irrigation canals will be dredged upstream.



in Morondava City Council	and/or synergies	synergies and coordination mechanisms	
Meeting (virtual) with the team in La Réunion jointly implementing the "Sustainable management of coastal areas" project	Gain understanding of the project to be initiated early next year and check potential overlaps and/or synergies	Relevant information collected concerning the project and discussion about synergies and coordination mechanisms	There is a common will to establish coordination mechanisms between the two projects especially regarding the implementation of activities at the local level, but also to share results of environmental and technical studies.
<b>Morondava community level</b>			
Community members and representatives of Tanambao neighbourhood	Gain understanding of issues and needs regarding proposed interventions / activities and validate risks mitigation measures.	Better understanding of the local organisation in case of disaster and challenges.	Since the central government was forbidden from using schools as shelter when a disaster occurs, community members are preoccupied knowing that the capacity of being hosted by other families is limited and depends on the number of households impacted. This system used to work until now, with no discrimination, but it would be insufficient. Also, the early warning system should be improved. With its current system of flag of colours, it makes it difficult to reach informal and remote communities.
Community members and representatives of Avaradrova and Sans Fil	These two neighbourhoods are located next to main flood prone areas. It was therefore necessary to understand the main climate change impacts and related needs.	Sustainability measures were discussed with the community regarding the preservation of the mangroves.	Community members understand the urgent need for replanting and preserving the mangroves since their main livelihood activity depends on crab fishery. They are committed to participate in planting and management activities to preserve the mangroves.

During an additional mission to Morondava in March 2018 where further technical, environmental and social assessments were done, marginalised and vulnerable groups were consulted in a series of focus group discussions in order to consider their in the project design (see **Annex 2** for data and information about marginalised and vulnerable groups in Morondava). The feedback from communities has directly influenced the project design of the following sub-projects: Rehabilitation of 180 ha of mangroves (Sub-Project Fiche 5.1.1); Establishment of a city-wide early warning system for floods (Sub-Project Fiche 5.1.3); Construction of a resilient and multi-purpose safe-haven (Sub-Project Fiche 5.1.4).

One consultation was organised with 8 women living with disabilities from different neighbourhoods in Morondava to discuss their views and needs on the proposed interventions. They flagged the problems they often face in evacuating when flood events occur. The water makes it particularly difficult for wheelchair users or other people with physical disabilities to move around and reach a safe place. They emphasised that the contingency plan should take this into account and make sure that mechanisms are in place to inform and support people with disabilities in the city (around 800, among which 30 with severe disability) in cooperation with the fire brigade. Concerning the construction of the safe haven, the group made two propositions that have been incorporated to the concept and design of the safe haven. Besides the fact that the resilient building needs to be easily accessible, it will also include a separate multi-function room in order to provide a safe place for women who feel particularly exposed to harassment and aggression. In addition, it was decided that the safe haven will serve as a community centre when not used as a shelter, where they can receive training to engage in income-generating activities.

Concerning the resilient and multi-purpose safe haven, a focus group discussion organised with 18 women from a women's association was particularly important for selecting the location. Three proposals were made, but only the location in Morondava centre was validated as a safe and suitable place. They emphasised the need for adequate sanitary conditions to avoid the spread of disease. The rehabilitation of mangroves was largely discussed with this group, which included the representative of a local association "Ambohotsimirany" of the Betania Neighbourhood which is already working on several topics such as hygiene, health and environment. The local association

counts around 30 members and they are ready to support the dissemination and replication of their activities relating to awareness-raising for mangrove protection in other neighbourhoods.

The issue of the rehabilitation of mangroves was also discussed during a community consultation in the Tanambao neighbourhood. 70 people were recorded (30 women, 40 men) by UN-Habitat staff, although only 30 people signed the attendance sheet. What emerged from this consultation is that 80% of the households live from crab fishery and they understand the importance and urgency of restoring the ecosystem in order to guarantee their livelihoods. Also, the lessons learned from a small-scale project of the Ministry of Fishery were discussed and the population agreed on the importance of working with local fishermen for successful implementation, especially regarding the choice of mangrove species and nursery.

To complete the consultative process, a series of meetings was organised, from 8-11 October 2018, to gather further data on marginalised and vulnerable groups in the project sites, review the Environmental and Social Impact Assessments (ESIA) and develop the Environmental and Social Management Plan (ESMP) for the city of Morondava. A public disclosure of the ESMP was held on 12 October 2018. The proposed ESMP for Morondava (see **Annex 3**) was validated by local authorities, community representatives and main relevant stakeholders (see the signed support letter in the following link: [http://dimsur.org/annex4\\_supportlettermorondava\\_esmp/](http://dimsur.org/annex4_supportlettermorondava_esmp/)).

### ➤ **Malawi**

In Zomba, the consultation process involved the national (Department of Disaster Management Affairs, DoDMA), city (Zomba City Council) as well as the neighbourhood levels (neighbourhoods Chambo, Likangala, Mbedza and Mtiya). Overall 200 people, among them municipal technical staff, community representatives, civil society organizations and the Zomba Polytechnic, directly participated in the data collection, risk mapping exercises and identification of priority actions during the resilience action planning process in 2015 (see the following link for more information about consultations in Zomba: <http://dimsur.org/annex-4-local-consultations-and-esmp-support-letter-zomba-malawi-june-july-2017/>). For the elaboration and adoption of the City Resilience Action Plan of Zomba using the CityRAP Tool, the following workshops were organised:

- 22-24 November 2015: data analysis workshop with the municipal focal points and the support of the UN-Habitat team;
- 25 November 2015: Prioritisation workshop with representatives from the local communities of Chambo, Likangala, Mbedza and Mtiya and municipal technicians. As a result, the City of Zomba came out with five priority actions for its Resilience Action Plan;
- 27 November 2015: Validation workshop with representatives from the Zomba City Council, municipal technicians and community representatives. The plan was approved and referred to the city council for further detailing of priority actions and related budgeting.

Further consultations were had with the Zomba City Council to validate the indicative provisions at the concept note stage. Zomba City Council management and Council studied the concept note in December 2016 and positively commented on the planned activities targeting the city of Zomba under Component 1. They informed that it would be appreciated if environmental enhancement projects such as tree planting and management, as well as land conservation would be reinforced under this component. They also emphasised the need to promote community exchanges at the national level, an activity that could be integrated under Component 2. In-depth local consultations took place between 12-16 June and 22-24 July 2017. During these consultations, representatives from all wards participated and representation of women, youth, older persons and persons with disabilities was ensured. Additional Ministerial-level consultations to further detail activities under Component 2 took place on 20 July 2017.

From 25-29 September 2017, project site visits and further local consultations took place with a view to assess the feasibility and social and environmental risks of the planned project activities and consider the needs of vulnerable people in the project design. Overall, more detail to assess the feasibility was gathered. The table below gives an overview of these consultations and summarises the outcomes.

Table 2: Overview of consultations carried out in Zomba from 25-29 September 2017

Stakeholder, incl. role / function	Consultation objective	Outcome	Conclusion
<b>Zomba city level</b>			
City Council: Chief Executive, Chief Urban Planner, Chief Engineer, Community Mobilizer	Obtain required detail to fill environmental and social risk screening sheets and agree on interventions	Environmental and social risk screening sheets filled in; Agreement reached on final interventions subsequent to project site visits and analysis of all data at the end of the week, and Understanding reached regarding grievance mechanism.	City council fully supported the mission (with technical specialists made available for the full week). Grievance mechanism should involve ward and community committee and traditional chiefs and communication should be by word, phone or letter.
Zomba District Forest Office	Gain understanding of the challenges and opportunities regarding afforestation / tree planting within the city boundaries of Zomba	Afforestation was successful in two wards due to drafting of community by-laws (by community and District Office).	The recommendation was made to work together with the District Forest Office to draft community by-laws in target wards.
Forest Research Institute of Malawi (FRIM)	Gain understanding of technical challenges and opportunities regarding afforestation / tree planting in urban context	The institute can advise on how to set up tree nurseries and on which species to plant. They would also provide seedlings for the same and have worked with communities to produce energy efficient cooking stoves.	During project implementation, collaboration should be ensured with FRIM to set up nurseries and plant trees. FRIM should also advise on the most effective techniques for producing and replicating cook stoves.
LEAD International	Gain understanding of the main issues and needs in Zomba and lessons learned regarding former projects carried out by LEAD International	LEAD International shared lessons learned regarding the establishment of an EWS and afforestation efforts, which have been integrated into the proposal (Part II Section G) and are in line with the needs and issues raised by the communities and vulnerable groups.	Possibly work together with LEAD International (through Oxfam) to execute the supporting interventions.
Sub-contractor for engineering works in Zomba	Explore feasibility and costs of drainage and river training interventions	Cost estimations	The costing estimates given proved to be in-line with former calculations based on information by the City Council
<b>Zomba ward and community level</b>			
Marginalized and vulnerable groups (youth, older persons, persons with disabilities, people living with HIV/ AIDS, orphans) and women in Chambo and Sadzi	Get an understanding of their particular issues and needs regarding proposed interventions /	For main issues and needs see information below the table	Issues and needs have been integrated in the design of interventions / activities

ward	activities and validate risks mitigation measures		
Ward committee members and representatives in Likangala ward (two female and five males, out of which 2 youths)	As Likangala is located next to the main river it was heavily impacted by the 2014/15 floods. It was therefore necessary to understand the main climate change impacts and related needs even though this ward was not prioritised during the CityRAP process before.	Ward committee members identified similar issues and needs as in the other wards located next to the main river.	Include EWS interventions and some small river training interventions (as part of the larger river system) in Likangala (see sub-project risk assessment sheets in <b>Annex 3</b> )
Discuss proposed intervention sites in all target wards with city council technical specialists and community members	Assess feasibility and risks of proposed interventions	Joint project site visits undertaken with Zomba City Council technical specialists and community members, and Details to understand feasibility and risks and to fill risks screening sheets acquired	Some interventions and activities have been simplified and in the case of waste, this was reduced to supporting activities (to sustain other interventions and mitigate risks)

Among the vulnerable groups typified by the Adaptation Fund, children, women and girls, older persons, persons with disabilities and people living with HIV/AIDS were consulted. Currently there are no indigenous or tribal groups and no displaced people or refugees living in Zomba (see **Annex 2** for data and information on vulnerable groups in Zomba).

For the consultations, the project screening team suggested the wards with most concrete interventions and those with high exposure to imminent flooding risks. Other selection criteria were the presence of a representative number of marginalized and vulnerable people. Accordingly, the two wards Chambo and Sadzi were chosen, which were particularly affected during the last flooding incidents. In Chambo, 25 people participated in the focus group discussions: 7 children, 12 women and 6 men. Out of the latter, 3 were elderly and one person differently abled. HIV positive individuals were present but did not identify themselves as such; hence, the number could not be quantified. In Sadzi, 21 people participated, out of which there were 2 with disabilities, 3 HIV positive, 6 children/youth, 5 women, 2 orphans and 3 elderly. The feedback from communities directly influenced the project design of the following sub-projects: Establishment of a city-wide early warning system for floods (Sub-Project Fiche 5.2.1); Construction of multi-purpose evacuation centres (Sub-Project Fiche 5.2.2); Sustainable urban forest management (Sub-Project Fiche 5.2.7).

As identified needs, the facilitators recorded that the design of the evacuation centres should be sensitive to gender issues and the needs of older persons and persons with disabilities. Specific needs were recorded for the respective groups as follows:

- Women raised the concern that they, together with small children, usually spend more time in the evacuation centres and are the ones left to cook food for their families. Sanitary facilities are oftentimes in short supply especially for them. Further, women, girls and children can be exposed to sexual abuse in times of disasters.
- Children said they would wish to have a place to play with others, a separate room if possible, in the evacuation centres.
- Elderly and persons with disabilities have problems reaching the evacuation centres before they are caught up in floods, as their mobility is compromised. Individuals with disabilities explained the additional challenge, in terms of sanitation and hygiene in times of floods, of using water borne toilets.
- HIV positive people mentioned facing difficulties of continuous antiretroviral therapy in times of disasters.

Accordingly, the evacuation centres will be designed with additional toilets/wash rooms built specifically for women and girls; water borne toilets and pit latrines for easier access by older persons, persons with disabilities and children, and overall better hygienic standards; separate rooms for women and young children, female youth, male youth, and men; as well as access ramps for persons with disabilities. In terms of outfitting of the centres, bicycle ambulances will be set up at each evacuation centre to enable rescuing elderly and persons with disabilities from disaster zones; first aid kits with medical supply of antiretroviral drugs (ARVs) will be stationed there as well. Women are overrepresented in the target areas and actively participate in deforestation. They confirmed this in the focus group discussions held. There is a need for them to develop alternative livelihoods to secure their family income. In response, women will be specifically targeted for training activities (e.g. construction of energy efficient cook stoves and briquette making).

From 23-26 October 2018 a series of meetings was organised to gather further data on marginalised and vulnerable groups in the project sites, to review the Environmental and Social Impact Assessments (ESIA) and develop the Environmental and Social Management Plan (ESMP) for the city of Zomba. A public disclosure of the ESMP was held on 25 October 2018. The proposed ESMP for Zomba (see **Annex 3**) was validated by local authorities, community representatives and main relevant stakeholders (see the support letter in the following link: [http://dmsur.org/annex4\\_supportletterzomba\\_esmp/](http://dmsur.org/annex4_supportletterzomba_esmp/)).

### ➤ **Mozambique**

The consultation process in Chokwe involved key stakeholders in the spheres of urban governance and development including city councillors, management and technical staff, as well as communities and civil society (see the following link for more information about consultations in Chokwe: <http://dmsur.org/annex-4-local-consultations-and-support-letter-esmp-in-chokwe-mozambique/>).

Overall, 116 persons directly participated in the data collection and identification of priority actions contributing to the elaboration and adoption of the City Resilience Action Plan of Chokwe using the CityRAP Tool. Two workshops were organised for this purpose:

- 1 September 2015: prioritisation workshop during which 6 priority issues were selected with the participation of around 30 representatives of local stakeholders, including communities and municipal staff;
- 3 September 2015: validation workshop, during which 40 participants validated the priority issues and activities identified in the City Resilience Action Plan of Chokwe prepared by the team of municipal focal points with UN-Habitat support. During the consultative process, all municipal sectors were involved, and two local communities consulted.

The in-depth local consultations took place between 10 and 14 July 2017, where the priority interventions were selected including the target neighbourhoods. The priority interventions included improvement of the drainage systems, slum upgrading, establishing early warning systems and water absorption measures. Additional Ministerial-level consultations to further detail activities under Component 3 took place on 19 July 2017.

Further consultations were conducted with the Chokwe Municipal Council and the targeted neighbourhoods in order to validate the selected priority interventions. These consultations took place from 30 October to 3 November 2017. More than 200 people attended the consultations at the community level. The Chokwe Municipal Council emphasised the need for the selected interventions and stressed the fact that as part of its Five-Year Municipal Plan, it is very critical that activities are fully implemented since such interventions will reduce the vulnerability to floods. During the three days, field visits at the selected were conducted with the purpose of spatially identifying the interventions and drafting the priority interventions map which shows the location of the project sites. Moreover, each neighbourhood was consulted about the priority interventions and their special needs. Sustainability aspects of the projects were discussed with communities. Further, the need for developing feasibility studies regarding the proposed interventions was confirmed. Thus field visits to assess the proposed interventions and consultations with stakeholders took place for 3 days, from 28 February to 3 March 2018.

Table 3: Overview of consultations carried out in Chokwe from 30 October to 3 March 20178

Stakeholder, incl. role / function	Consultation objective	Outcome	Conclusion
<b>Chokwe city level</b>			
Municipal Council	Update the city council about the AF project proposal. Promote a receptive environment at the city level for the implementation of the activities. Provide a basis for the procedures on the preparation of the proposal: explain the importance of the consultation and the participatory planning for climate adaptation in the city of Chokwe.	Targeted neighbourhoods reinforced alternative options to reduce flood-related risks: improving the drainage system of the city and establishing early warning systems and well as investing in awareness-raising to climate change at the community level. The Mayor stressed the importance of continuing advocacy and capacity building in participatory planning for resilience building.	Ownership, engagement and commitment of the Municipal Technicians for supporting the public consultation and the activities for the proposal is demonstrated. The Directorate of Urbanization at the city level is responsible for leading the activities within the scope of the AF project proposal. The City Council, understands the next steps to be taken and the importance of creating a receptive environment for project implementation
Municipal Councillors of Urbanization, Environment and Social Sectors staff, including municipal technicians from the urbanization sector		The City Councillors and the Municipal Technicians understand the scope of the AF project proposal and what efforts are needed for a successful proposal. A work plan was agreed for the field visits and the public consultations with the target neighbourhoods. Priority interventions were also reviewed from the previous consultations and alternative solutions were briefly discussed.	The Municipal Technicians should work closely with the UN-Habitat staff during the field visits and the councillors should provide all the necessary guidance. The proposed interventions must be spatially represented in a good manner with the support of the municipal technicians, in order to make sure they contribute to floods mitigation.
<b>Chokwe Neighbourhood and community level</b>			
Neighbourhood's community members	Public consultations with the local communities in the targeted neighbourhoods 2, 3, 4 & 5 including special consultations with the marginalized and vulnerable groups.  Validate the proposed interventions.  Field visit to the target neighbourhoods 2, 3, 4 & 5 to spatially identify where the interventions should take place and the high-risk areas.  Understand the	Maps of the high-risk areas were produced; Concrete interventions were identified and located in the field, and Cost estimations performed.	The proposed interventions were consolidated in two big projects: rehabilitation/construction of drainage channels and establishment of the early warning systems, including escape routes and centres. The local communities demonstrated commitment to support the implementation of the planned interventions, including defining a grievance mechanism when necessary.

	whole drainage system and how it functions and understand how the early warning systems should work in the entire city, considering the priority neighbourhoods.		
<b>Others</b>			
FIPAG	Assess the water distribution and the available water for the communities affected by floods and droughts to decide on whether to include priority interventions for the water harvesting system.	FIPAG (Water Supply Assets Investment Fund) understands the scope of the project proposal and explains its plans regarding water accessibility in the city. UN-Habitat understands that the local communities in Chokwe have access to drinking water even during floods, however, some of the equipment for water distribution is affected during floods, compromising the access to safe water.	There is no necessity to invest in water harvesting system as the communities have access to drinking water and the coverage of water distribution is planned to increase in the coming year. FIPAG has already in its action plan to strengthen the capacity of the equipment for water distribution and treatment during floods emergency.
HICEP	Understand the functioning of the Drainage System and discuss the sustainability of interventions on the drainage.	HICEP (Chokwe Hydraulic) is responsible for the land irrigation channel management in Chokwe District (including the City of Chokwe). It has also supported the maintenance of the drainage channels. The outlet to the irrigation channel was subject to neglect in terms of structural upkeep, urban storm-water planning, and waste management procedures. This neglect has led to the increased risk of flooding and hygiene issues within the area. With the impacts of climate change rapidly increasing, and the sanitation issues in the area unanswered, a solution is needed to mitigate a potentially more devastating issue.	There is a need to rehabilitate the drainage outlets (southern drainage), as these are the primary reason for the weak functioning of the whole southern drainage channel. Moreover, maintenance of the drainage which is actually linked to the waste management is deemed necessary and HICEP was supporting the Municipality in providing such services, however, the efforts are not enough due to financing reasons.  HICEP ensures it's entire support on the drainage maintenance activities, which will work closely with the Municipality, and validated the proposed interventions on the drainage system.
ARA Sul		ARA-Sul (Southern Region Water Administration) is the water agency responsible for the river basins in southern Mozambique, including the trans-boundary flood prone rivers Limpopo	ARA Sul reinforces the need for strengthening the EWS at the city level.  ARA Sul will fully support the intervention and proposed the creation of a multi-institutional committee for this purpose, comprised by INGC, ARA Sul, HICEP and the Municipality



		<p>and Maputo. It is strongly involved in the hydrological modelling including water availability, dam operation and flood forecasting. ARA Sul is responsible for the early warning system of the Limpopo Region in Mozambique.</p> <p>The functioning of the EWS in Chokwe (from district to city level) was explained by ARA Sul and the weaknesses of the system were identified.</p>	<p>to address the EWS issues at the city level and ensure a good coordination and communication strategy with the whole region.</p>
--	--	---	---

Separate consultation sessions were undertaken in the four target neighbourhoods with people who have disabilities such as blindness, deficiency in the lower limbs, and deficiency of the upper limbs, older persons and women. Particularly the persons with disabilities expressed their struggles when it comes to floods. Usually these individuals do not have specific assistance for evacuation, unless a friend, a neighbour or a close relative helps them. However, most of the time they cannot be evacuated since everyone needs to hurry to the safer places. The most they can do is to hide above trees or on the roof of the houses, accompanied by children or pregnant women, including older people who could not manage to be evacuated in time. There is no social protection system for this group during emergency periods. Therefore, the evacuation routes should consider their conditions, as well as the evacuation centres. This group expressed interest in acquiring bicycles that could help them as well as an efficient EWS and regular drills, including children (see **Annex 2** for data and information on marginalised and vulnerable groups in Chokwe).

*Table 4: Overview of consultations with vulnerable groups carried out in Chokwe from 30 October to 3 November 2017*

Vulnerable group	Consultation meeting s they participated in (dates)	Needs and issues regarding proposed project activities	Activities responding to these demands
Women, persons with disabilities and older persons	1 Nov. in neighbourhoods 4 and 5	<p>Older persons need special attention for evacuation purposes during floods;</p> <p>Persons with disabilities have serious difficulties in escaping to safe areas and most of the times get support from friends, neighbours or close relatives to assist them to a safe place like the top of a tree or roof of a house;</p> <p>Women have to prioritize their small children first and sometimes they take care of them alone; and</p> <p>The existing evacuation centre is located far away in another settlement outside Chokwe, causing more difficulties to access easily and without support.</p>	<p>Special bicycles to be provided to the persons with disabilities for use during emergency periods;</p> <p>Evacuation centres in a closer place/ neighbourhood to ease the evacuation process;</p> <p>Evacuation centres with separate rooms for women and men, and</p> <p>A Neighbourhood Emergency Committee that can work closely with the Local Disaster Management Committees.</p>
Women, persons with disabilities, older persons and children	2 Nov. in neighbourhoods 2 and 3	<p>There is water available for drinking, no need to invest in new water pipes;</p> <p>Older persons need special attention for evacuation purposes during floods;</p> <p>Persons with disabilities have serious difficulties in escaping to safe areas and most of the time get support from friends,</p>	<p>Special bicycles to be provided to the persons with disabilities for use during emergency periods;</p> <p>Evacuation centres in a closer place/ neighbourhood to ease the evacuation process;</p>



		<p>neighbours or close relatives to assist them to a safe place like the top of tree or roof of a house;</p> <p>Woman have to prioritise their little children first and sometimes they take care of all of them alone;</p> <p>Children have no notion of what happens or how they should proceed, so drills are a priority for them to be aware on the disaster events and learn on how to make themselves safe during emergencies; and</p> <p>The existing evacuation centre is in located in another city outside of Chokwe and it is far, creating more difficult to access easily and without support.</p>	<p>Evacuation centres with separate rooms for women and men;</p> <p>A Neighbourhood Emergency Committee that can work closely with the Local Disaster Management Committees, and</p> <p>Emergency drills for everyone, especially involving and tailored for children.</p>
--	--	---	--

To conclude the consultative process series of meetings was organised, from 15-19 October 2018, gather further data on marginalised and vulnerable groups in the project sites, to review the Environmental and Social Impact Assessments (ESIA) and develop the Environmental and Social Management Plan (ESMP) for the city of Chokwe. A public disclosure of the ESMP was held on 19 October 2018. The proposed ESMP for Chokwe (see integrated ESMP in **Annex 3**) was validated by local authorities, community representatives and main relevant stakeholders (see the support letter in the following link: [http://dimsur.org/annex4\\_supportletterchokwe\\_esmp/](http://dimsur.org/annex4_supportletterchokwe_esmp/)).

### ➤ **Union of Comoros**

During the concept note formulation stage, a preliminary stakeholder consultation was held on 9 December 2016 with several stakeholders, including representatives from government institutions, academia and civil society, in order to elicit views and opinions on the concept note. The participants involved representatives from the Directorate General of Civil Security, the Karthala Volcanological Observatory, the NGO Ulanga Ngazidja, the National Network for Women and Development, the Comorian Red Crescent Society, the Comoros University, the National Agency for Civil Aviation and Meteorology, the Association of Mayors (see the following link for more information about consultations in Moroni: <http://dimsur.org/annex-4-local-consultations-and-esmp-support-letter-moroni-comoros/>). The participants appreciated the relevance of the project concept note and especially that it will be a first in the country to choose the capital for a project of this type. There was no objection to what is being proposed.

Between April and August 2017 priority interventions for building urban resilience in Moroni were identified through the implementation of the CityRAP tool, including a self-assessment of relevant institutions dealing with different aspects of city management and in-depth community consultations. A team of government technicians, including from the municipality of Moroni<sup>1</sup>, were trained and conducted the process of data collection and analysis, prioritisation and drafting of a preliminary City Resilience Framework for Action.

Between 20-24 November 2017, further consultation were held in Moroni to discuss and validate the proposed interventions with the City Council, relevant stakeholders and representatives of all selected neighbourhoods, including women, youth, older persons and persons with disabilities. The objective of the consultations was to assess the feasibility and social and environmental risks of the interventions proposed. The result of this procedure is presented in the table below. This consultative process facilitated the reorganisation of planned interventions according to the feasibility assessment.

---

<sup>1</sup> NB: The municipality of Moroni was established only in 2015, together with all other municipal authorities; it is still rather under-staffed. Various central government departments still have responsibilities in managing different sectorial issues in the city.

Table 27: Overview of consultations of consultations carried out in Moroni between 20 and 24 Nov. 2017

Stakeholder, incl. role / function	Consultation objective	Outcome	Conclusion
<b>Moroni city level</b>			
City council: General Secretary, Urban Planner; Chief of communities, local NGOs	Acquire required details for the environmental and social risk screening sheets, agree on interventions and grievance mechanism	Discussion conducted on environmental and social risks, agreement on interventions and decision to talk about grievance mechanism that can work in Moroni.	City Council fully supported the mission according to their capacity (low technical capacities), supporting coordination with local chiefs and communities. It was decided to discuss grievance mechanism during community consultations.
Disaster Risk Management Unit	Gain an understanding of the challenges and opportunities regarding an early warning system at the city level, in particular, regarding coordination and communication mechanisms with communities.	Better understanding of the necessary steps to implement an efficient early warning system.	The particular situation of Moroni, characterized by microclimates, requires adapted mechanisms to gather information (meteorological logic stations for example). The first step is to better understand needs at the local levels and organise workshop with the relevant stakeholder to design an adapted early warning system.
Comorian Red Crescent	Gain an understanding of the needs of marginalized and vulnerable groups and community organisations during disaster events as well as coordination and communication mechanisms with responsible authorities.	Better understanding of evacuation mechanisms organised by the communities and coordination with national force (army and DGSE) when needed.	The alert system is quite efficient in case of cyclone or volcanic eruption (at the national level using the mosques to alert communities), however there is no system in place in case of flash floods. Often communities self-organise and even have to alert authorities. People are often evacuated to community centres and schools or helped by other families. Community centres should be adapted to properly accommodate displaced people (sanitation facilities) instead of occupying schools.
Consultant engineer	Check feasibility and estimation costs of retention basins and drainage in La Coulée neighbourhood.	Cost estimations and feasibility completed.	Opened several questions regarding the dimension of interventions needed. Further hydrological and engineering studies are absolutely necessary to understand and design proper and adapted interventions.
<b>Moroni neighbourhoods and community level</b>			
Community members and representatives of La Coulée neighbourhood, and representatives of the neighbourhood association	Due to its location, La Coulée is particular affected by flash floods. The objective of the session was to better understand impacts and further discuss issues and needs regarding proposed interventions as well as risks mitigation measures	Better understanding of the neighbourhood organisation, including main challenges faced by the population.	The neighbourhood association is very strong in organising the community, including building and maintaining some infrastructure with very limited financial resources. The association will be a serious asset to support the construction and maintenance of planned interventions. Issues and needs have been integrated in the design of interventions / activities such as location of water standpipes and maintenance mechanisms. The neighbourhood association is a good channel for grievance mechanisms.
Members and representatives of Madjadjou-Djoman	Assess feasibility and risks of proposed interventions	Better understanding of land ownership situation and discuss potential solutions to be sure that the population will benefit from the interventions.	Since land is private in the neighbourhood, a "land readjustment" approach will be necessary including the commitment of the municipality, local population and the landowner.
Community members and	Assess feasibility and risks of proposed	The situation was very similar to the previous	Similar measures as mentioned above were proposed, but noting that some

representatives of Oubodoni-Mboueni	interventions	neighbourhood regarding intervention. Discussions were conducted to understand the land ownership situation and potential solutions.	lands belong to the municipality in this neighbourhood (more than 50%).
Badjanani-Mtsangani	Assess feasibility and risks of proposed interventions	Better understanding of root causes of flooding	Knowing that a drainage system is existent but absolutely non-functioning, the discussion lead to the conclusion that the most effective intervention would be to rehabilitate this existing drainage system by intervening on solid waste management. Equipment will have to be adapted to the characteristics of the Medina (narrow streets), using wheelbarrows or bikes to collect waste.

Marginalised and vulnerable groups were invited to participate in the consultations, including women and older persons (see **Annex 2** for data and information about marginalized and vulnerable groups in Moroni). It can be noted that HIV/AIDS is a taboo in Moroni, thus it was complicated to formally include this group in the discussions. The feedback from communities directly influenced the project design of the following sub-projects: Establishing a community-managed rainwater harvesting system in La Coulée neighbourhood (Sub-Project Fiche 5.4.2); Setting up a flood early warning system in La Coulée neighbourhood (Sub-Project Fiche 5.4.4).

A meeting was organised with the Comorian Red Crescent to ensure that the specific needs of all marginalised and vulnerable groups is taken into account. The first main area of discussion concerned the flood and cyclone early warning and evacuation system. Vulnerable groups testified of solidarity occurring in case of a disaster, being easily accepted to stay in host families until the situation returns to normal. Older persons however, expressed concerns concerning their belongings when they are evacuated.

During the expert mission conducted in March 2018, additional consultations were conducted with community members of La Coulée, the main area of intervention of the project: a general session, one focus group with the male population and one focus group with the female population. The general session was attended by 42 community members and focused on debating final proposed interventions in the area and how they will benefit the most marginalised and vulnerable in the neighbourhood. The participants agreed to the drainage proposal. Main discussions concerned solutions for improving water access. The community echoed that a communal rainwater harvesting system would be preferred. The possible set-ups and configurations of the system were discussed at length, the project representatives made a clear note that any system put in place will have its capacity limits, but the general consensus among participant was that any system will be an improvement over the current state. Inputs from this session were crucial to consolidate the sub-project that is proposed for establishing a rainwater harvesting community system.

The male focus group was attended by 17 participants. Further discussion was held over the distribution of harvested rainwater. It became apparent that many households will not be able to invest in a rainwater storage tank independently, which resulted in the proposal of mixed community systems that combines the construction of 4 community tanks with the construction of another 50 tanks through on-the-job trainings and participatory workshops. The men of the community would be very willing to help in maintaining all components of the system (tanks, pipes, channels) but request sufficient training on how to do so. Trainings and workshops will be conducted under Component 1 activities in La Coulée.

When asked about water use in the area, it became apparent that each household would require approximately 100 litres per day, with households allegedly being composed of 4 to 5 members on average. This differs from the information received from the female focus group, which was attended by 25 participants. The women informed that on average a family that is composed of 8 or 9 persons uses about 80 litres per day. This proposal used the higher daily value (20 litres per day) for specifying the rainwater harvesting community system sub-project. The women also highlighted that part of the population in La Coulée have higher incomes and are able to afford private water tanks in their homes. It was noted that the community system should benefit the ones in most need. Working with local associations and community leader for self-regulation was proposed as a solution for fair water access among the population. It was particularly important for the women to discuss water access due to their

current role in water collection. They clearly address that they are the ones collecting the water because they are the ones using it for cleaning, washing and bathing, among other domestic tasks.

Besides water access, the women also reinforced the negative impacts flash floods have especially due to the speed they run downstream, for which the drainage improvement proposal was welcomed. Finally, with regard to waste collection, it was informed that due to the lack of services they often have to add that to their domestic burdens, collecting the waste in their houses and bringing it to markets. Others have a hole in the ground on their own property where they put their waste. This can cause trouble during floods when waste is flushed away. Overall, the women were enthusiastic when affirming that they are willing to cooperate and work together to improve water and waste related condition, including with other communities up and downstream La Coulée.

To conclude the consultative process, a series of meetings was organised, from 2-5 October 2018, to gather further data on marginalised and vulnerable groups in the project sites, review the Environmental and Social Impact Assessments (ESIA) and develop the Environmental and Social Management Plan (ESMP) for the city of Moroni. A public disclosure of the ESMP was held on 30 November 2018. The proposed ESMP for Moroni (see **Annex 3**) was validated by local authorities, community representatives and main relevant stakeholders (see the support letter in the following link: [http://dmsur.org/annex4\\_supportlettermoroni\\_esmp-2/](http://dmsur.org/annex4_supportlettermoroni_esmp-2/)).



## Supporting photos



Elderly Group, Chokwe, November 2017



Women's Group, Chokwe, November 2017



Women's Group, Moroni, March 2018



Persons with disabilities group, Chokwe, September 2017



Disabled Women's Group, Morondava, March 2018



Women's associations Group, Morondava, March 2018



## 5.1. CITY: MORONDAVA, MADAGASCAR

### SUB-PROJECT FICHE 5.1.1: Rehabilitation of 180 ha of mangroves

#### Overview

This intervention will rehabilitate a total mangrove area of 180 ha. and will mainly concern the neighbourhoods of Nosikely, Tanambao, Andakabe and Avaradrova. The mangrove ecosystem has been overexploited by the local population and its degradation has affected livelihoods and reduced its

beneficial impact over the water system for coastal protection, flood buffer and stabilizing substrates composed of fine sediments, among other ecological benefits. The land status of this area is public and currently is used for fishing and fuel wood provision. To implement the sub-project Mangrove plants (300,000 propagules/year) and a drone are needed.

#### Implementation strategy and planned activities

The sub-project will be implemented in a participatory manner, addressing the needs and concerns from the different social groups, especially focusing on the poor, most vulnerable and women (see **Annex 2** for data and information on marginalised and vulnerable groups in Morondava).

A local NGO will be hired to coordinate implementation and recruit local workers through labour-intensive man power established by the International Labour Organisation and successfully applied in several occasions in Madagascar. A national specialist in mangrove



rehabilitation will be hired to coordinate and monitor the process.

Figure 1: Location of mangroves rehabilitation interventions

The following activities are planned (*for the budget references, please see Annex 1*):

1. Selection and contracting of NGO and local staff (*to be charged to Output 1.3 – see Budget Note C*).
2. Delimitation, assessment and preparation of land (*to be charged to BL1 – see Output 1.2*).
3. Harvesting and sorting of propagules, including establishment of tree nurseries (*to be charged to BL1 – see Output 1.2*).
4. Recruitment of local labour, prioritizing women workers (*to be charged to BL1 – see Output 1.2*).
5. Planting sessions (5-6 planting sessions per year) (*to be charged to BL1 – see Output 1.2*).
6. Monitoring and maintenance of planting fields (*to be charged to BL1 – see Output 1.2*).
7. On-site technical assistance for community mobilization, gender mainstreaming and planting techniques (*to be charged to BL2 – see Output 1.2*).
8. Preparation of awareness raising and training materials and dissemination (*to be charged to BL – see Output 1.2*).

9. Training and awareness raising activities on mangrove planting and conservation (*to be charged to BL4 – see Output 1.2*).
10. Purchase of equipment for mangrove planting and maintenance (truck, tools, etc.) (*to be charged to BL5 – see Output 1.2*).

Based on the lessons learned from previous experiences involving the city council and WWF (see Part II, Section G), the mangrove planting will be done mainly in rainy season, when the tide coefficient is higher. This will ensure that the young plants are submerged at each high tide, including during the hardest periods of the dry season. On this, the proposed methodology is to conduct the planting sessions of each month during the wet season i.e. from November to March.

#### **Social, economic and environmental benefits**

- Approximately 27,800 people (50% women) will benefit from the role the rehabilitated mangroves will play as buffer zones during floods and their capacity to absorb the excess of water;
- Nearly 1,300 households (the equivalent to 15.5% of the population) that depend on fishing and rely on mangrove fauna (especially women, fishermen and informal settlers) will benefit from the sustainable exploitation of the rehabilitated ecosystem, impacting their livelihoods and the local economy;
- The total population of the city (63,000 people) will indirectly benefit from the ecological value derived from the rehabilitated ecosystem.

#### **Sustainability**

Considering that overexploitation is the main reason for the degradation of the mangroves, the main concern of this intervention will be to ensure that the local population has a balanced and sustainable relationship with the rehabilitated ecosystem. Importantly, during the local consultations conducted in Morondava, community members explained that the mind set of most of the fishermen and local population has been shifting and is increasingly concerned with the preservation of the existing mangrove. Therefore, the following activities will be conducted to support preservation and sustainable exploitation of the area:

- Conduct workshops and awareness-raising activities for mangrove preservation before each planting session (5-6 per year) with local population involved in the planting and their households;
- Produce and distribute communication material on how to rehabilitate the mangroves and maintain a sustainable relationship with the ecosystem;
- Promote and support use of alternative cooking methods to prevent woodcutting through workshops and trainings, especially with women;
- Support the creation of a community association focused on mangrove protection and sustainable exploitation in the target areas. Inspiration and partnership should be sought with association Ambohitsimirany, from the Betania neighbourhood, which has been successfully promoting mangrove protection in the city.
- Facilitate the signature of collective conventions between the municipality and communities about what areas are protected and what areas are not (and therefore allows cutting trees). A local structure for integrated mangrove management, protection and conservation will be established following the Inter-Ministerial Provision n°32-100/2014 from 24 October 2014.

### **SUB-PROJECT FICHE 5.1.2: Urban greening interventions in high risk areas**

#### **Overview**

This intervention consists of implementing some urban greening interventions along one of the main avenues of the city particularly at risk of flooding and subsequent erosion. The targeted section of the avenue (110 m long) lies in between two flood plains; it is elevated and serves both as evacuation route and as a protective dyke against floods (see exact location in figure 2). The land status of this area is public along the main avenue. The idea of the sub-project is to plant vegetation (neems, acacias and coconuts trees) that can protect this vital infrastructure for the city from soil erosion, prevent further building construction in floodplains, and take advantage of it to develop some public spaces to improve the quality of life for its inhabitants (like benches, playground installation, sanitary units, trash cans).

#### **Implementation strategy and planned activities**

The following activities are planned for this sub-project (*for the budget references, please see Annex 1*):





purpose of real time monitoring of the Hellot Channel and the Kabatomena River, the following materials will be needed: equipment for one disaster risk surveillance centre, 14 sirens, one lifeboat, 20 life jackets, 2 sets for river gauge measurement. In order to obtain efficient results, technical, operational and institutional capacities need to be strengthened to implement efficient preparedness and response mechanisms. To this end, the EWS will be completed by the identification and marking of escape routes to hospitals and evacuation centres.

### Implementation strategy and planned activities

The first step consists of carrying out a detailed study to set up the EWS, including installing the river gauging stations, the sirens and the necessary equipment in the surveillance centre. The study will have to be validated by the local stakeholders, including focal points of the National Bureau of Risk and Disaster Management BNGRC in the Menabe region, city technicians and officials as well as community leaders.

Based on available information and priorities, the second step will determine the preparedness and response measures to be implemented when a disaster occurs. Early warning system will be an efficient measure in Morondava, knowing that the time between the moment of the rainfall upstream and the critical rising water levels downstream is about 48 to 72 hours.

The following activities are planned (for the budget references, please see **Annex 1**):

1. Selection and contracting of local staff (to be charged to Output 1.3 – see Budget Note C).
2. Conduct the Morondava river's watershed study (to be charged to BL9).
3. Set up river gauge measurement automatic stations including reception computer equipment for real time monitoring of the Hellot Channel and the Kabatomena River, and install the automated sirens (see Figure 3) (to be charged to BL10 and BL12).
4. Develop a communication strategy and deliver training on the alarm system and escape routes to be properly marked (to be charged to BL11).

### Social, economic and environmental benefits

- Ensure fully participatory planning taking into account the special needs of marginalized and vulnerable groups and gender-sensitive to design the EWS and identify escapes routes, to be compliant with the concerns raised during the consultation with women and persons with disabilities (see Part II, Section I).
- The total population of the city (63,000 people) will benefit from being informed and knowing how to react when a disaster strikes.

### Sustainability

The success of the sub-project highly depends on public authorities' capacities to respond to the threatened disaster. This is why capacity building occupies an eminent place in the implementation of this intervention. The objective is to ensure the retention of knowledge at the local level by delivering training to city officials and technicians on the effective management of the EWS that was set up. The early warning will trigger an emergency response (e.g. evacuation) based on the level of risk. The

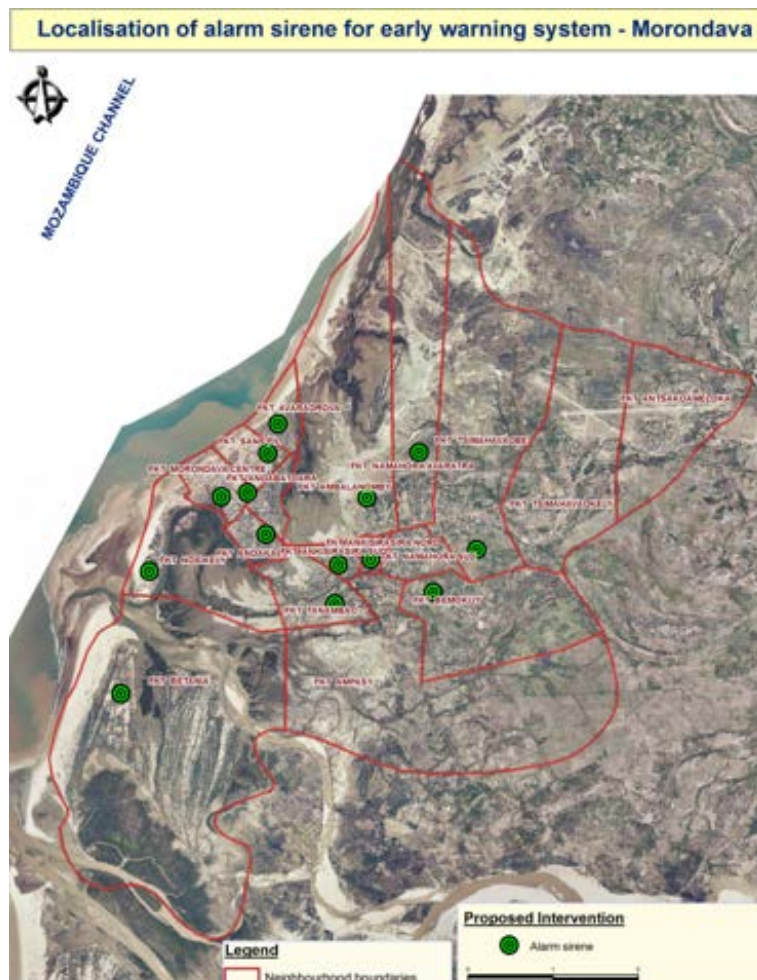


Figure 3: Location of the automated sirens

construction of the multi-purpose safe haven (see Sub-Project Fiche 5.1.4) will integrate a surveillance centre. Therefore, the following activities will be conducted to ensure the long-term efficiency and effectiveness of the EWS:

- Strengthen municipal staff capacities for effectively managed the established EWS for floods;
- Conduct awareness raising campaign on the operation of the warning system and escape routes, regular drillings, especially in cooperation with community committees;
- Improve coordination and communication mechanisms between the regional directorate of meteorology, municipal authorities and local disaster risk management committees.

#### **SUB-PROJECT FICHE 5.1.4: Construction of a resilient and multi-purpose safe-haven**

##### **Overview**

Since 2016, in Madagascar, schools are no longer allowed to be used as a shelter during extreme events, due to the sometimes prolonged disruption it often causes on children's school attendance. The construction of a multi-purpose safe-haven is considered to be a priority to ensure improved safety of

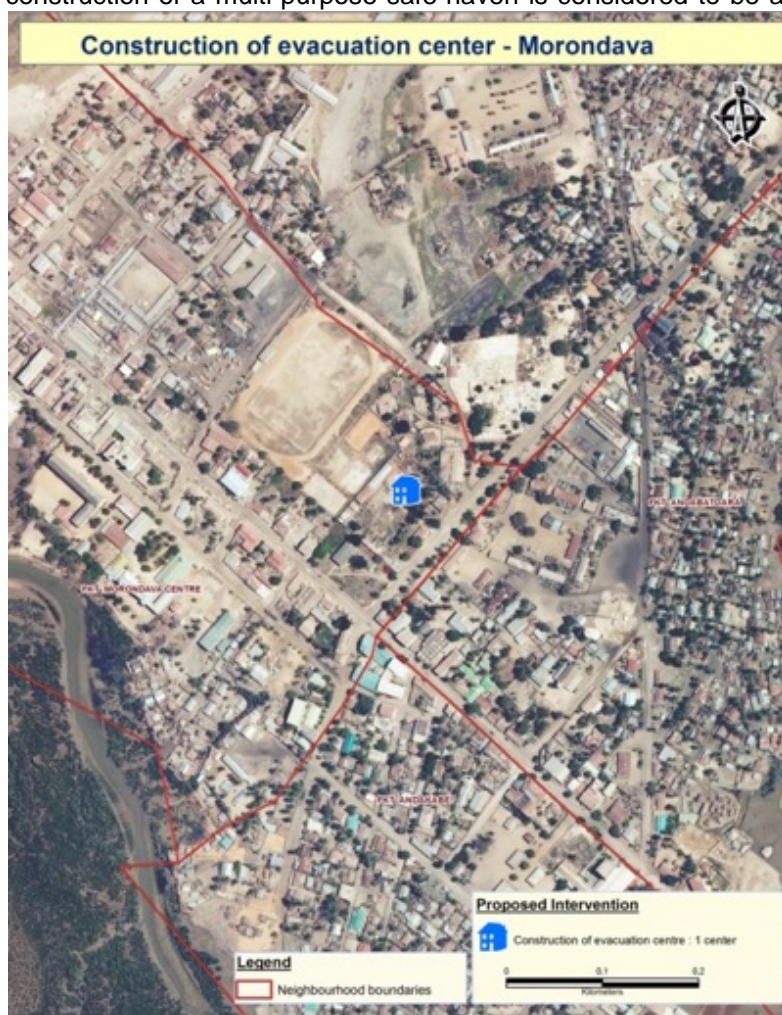


Figure 4: Location of the evacuation center

the population in case of a natural hazard, typically floods or cyclones.

This reinforced concrete and masonry building, designed to withstand strong winds and high floods, will be able to harvest rain water and host different activities/groups at normal times. In particular, it will accommodate a surveillance centre (see Sub-Project Fiche 5.1.3 related to early warning system) as well as a community and vocational training centre. The location of the building in the city centre is strategic. The 415 m<sup>2</sup> structure will have two sanitary units and the capacity to host up to 200 people in case of an emergency. It will also be provided with facilities so that it can easily be accessible by older persons and persons with disabilities. Vocational training activities, in particular targeting women and persons with disabilities, will be delivered in the facility. Last but not least, the construction phase will be an occasion to mobilise high-level expertise in resilient construction so that the knowledge on how to build to better withstand natural hazards can be disseminated in

Morondava.

##### **Implementation strategy and planned activities**

The planned activities for constructing and operationalizing the multi-purpose safe-haven are (for the budget references, please see **Annex 1**):

1. Preparation of detailed architectural plans (NB: the proper design of a disaster-resistant building is of crucial importance – see below) and related bill of quantities, and validation by the concerned communities and municipality (to be charged to Output 1.1 – see Budget Note A and to BL13).
2. Selection and contracting of a local contractor, including recruitment of local labour among community members, as much as possible (to be charged to Output 1.3 – see Budget Note C).



3. Construction works through on-the-job training (*to be charged to BL 14*).
4. Operationalisation of the safe-haven, especially its different activities (surveillance centre; community and vocational training centre; etc.) and formal agreement between the different concerned parties on the management mechanisms of the building (*to be charged to Output 1.3 – see Budget Note C*).
5. Technical assistance (as needed), monitoring and supervision (*to be charged to BL 13*).

### Social, economic and environmental benefits

- The population of the neighbouring communities that are particularly at risk during flood or cyclone events will have access to a safe-haven, namely: Nosikely, Andakabe, Morondava Centre, Sans Fil, Andabatoara and Avaradrova neighbourhoods;
- The needs of vulnerable people and women will be taken into account in the design of the multi-purpose shelter; indeed, some marginalised and vulnerable groups such as persons with disabilities and older persons clearly expressed the need to address this concern during the local consultations;
- The safe-haven will serve as a community centre for women and persons with disabilities where they will receive training to engage in income-generating activities;
- The safe-haven will also host a surveillance centre to monitor in real time the Hellot Channel and the Kabatomena River, as part of the early warning system for floods to be set up with this project. Similar approaches of multi-purpose safe havens have been successfully implemented in two other Districts of the country providing relevant lessons learnt for the intervention.

### Sustainability

One of the important aspects of this sub-project in terms of sustainability is to ensure the retention of knowledge at the local level regarding resilient building construction. Considering the extreme climatic vulnerability of the city and the lack of funding for large-scale interventions, it is recommended to promote a “living with floods/cyclones” culture, in which construction techniques play an important role. UN-Habitat has a long experience of that in Mozambique and knowledge/best experiences can be shared in Component 3 of the proposal related to regional exchange activities among the 4 participating countries. Therefore, the building will be constructed through on-the-job training activities including on-site training workshops to local master builders, so that some of the adopted construction solutions can be replicated elsewhere in the city.

Secondly, the fact that this is a multi-purpose building, with clear functions both during emergency times and normal times, surely confers a degree of sustainability to the sub-project. Finally, clear management mechanisms, with shared responsibilities among the different stakeholders who will be using the safe-haven, will also represent an important aspect to ensure sustainability.

### Design details

Figure 5: Ground floor of the multi-purpose safe haven for Morondava

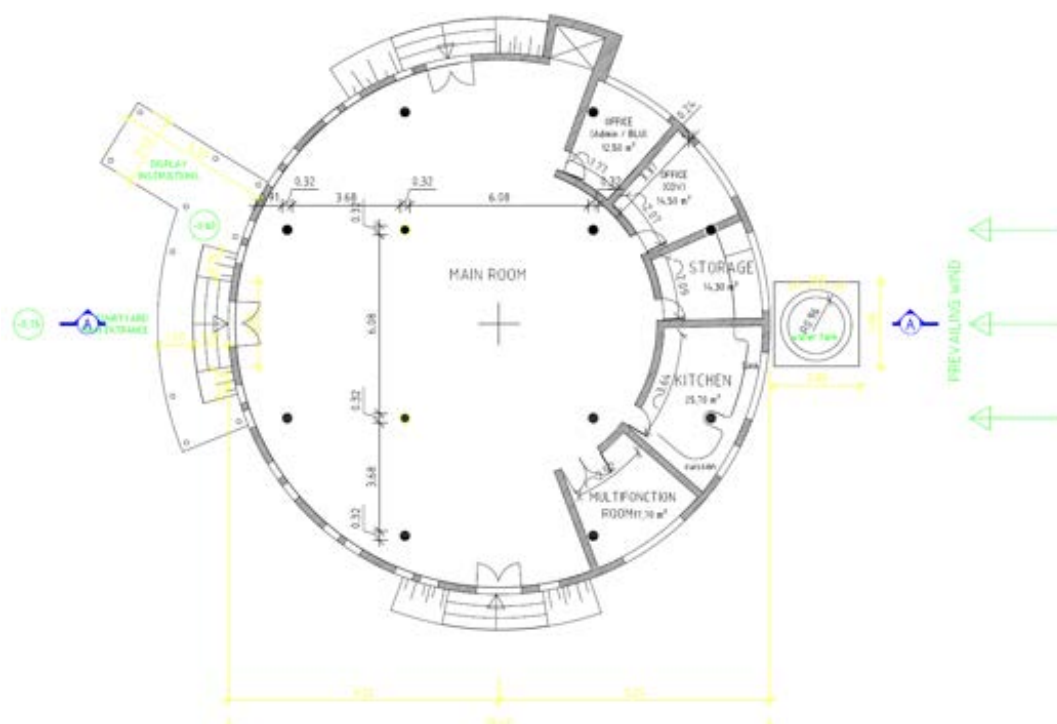
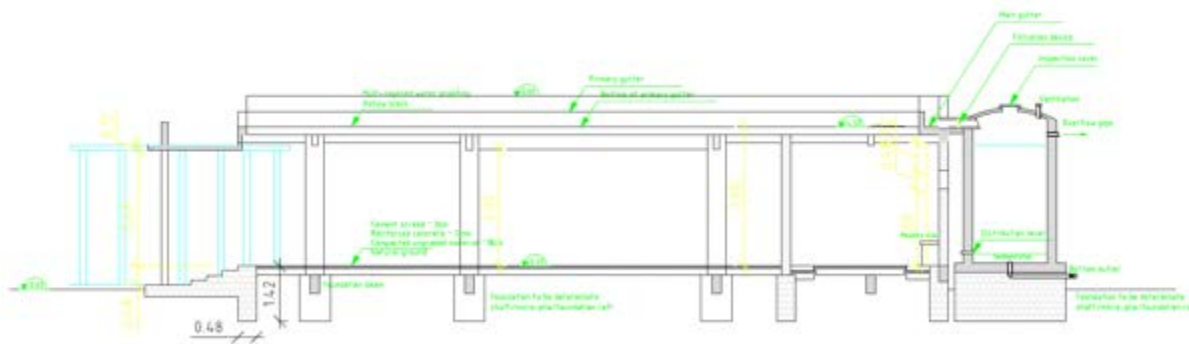


Figure 6: Section of the multi-purpose safe haven for Morondava



### **SUB-PROJECT FICHE 5.1.5: Construction of a flood-proof elevated road with improved drainage capacity**

#### **Overview**

This intervention will elevate and pave an important road (see location in figure 7) that connects southern neighbourhoods to the main road and other crucial services. Lateral drainage ditches will also be built along the improved road, for a length of 920 m. The road will be elevated 40 cm with clean soil to be watered and compacted layer by layer, and it will be provided with large pipes underneath to make sure that it will not create a barrier to flood waters. The elevated road will be resistant to flooding, especially during exceptionally high tides. The lateral drainage ditches will be in local masonry.

The link to the main road is precarious and currently unsafe for the population of Ankisirasira Sud, Ankisirasira Nord and Tanambao neighbourhoods, where high concentration of urban poor and marginalized and vulnerable groups are observed. The rehabilitation of the road stretch will improve connectivity and facilitate evacuation during flood events, proving better access to key infrastructure



Figure 7: Location of the new road and 3 new bridges (see Sub-Project Fiche 5.1.6)

and services (e.g. hospital and the multi-purpose safe-haven to be built – see Sub-Project Fiche 5.1.4). The eastern neighbourhoods of Ampasy, Andakabe and Bemokijy will also improve from better access to the city centre and the other side of Morondava.

Additionally, the new drainage channels will contribute for improving the poor sanitation conditions in the area. In Ankisirasira Sud, for instance, there is water logging near the road and around a nearby school, which is causing health risks for the people, including women and children. Constructing the new drainage ditches alongside the new road stretch is less costly than starting new drainage infrastructure from scratch and is therefore recommended due to its proximity to the Hellot Channel.

#### **Implementation strategy and planned activities**

The planned activities for this sub-project are (for the budget references, please see **Annex 1**):

1. Preparation of detailed studies, including technical specifications, bills of quantities and

detailed designs (to be charged to Output 1.1 – see Budget Note A and to BL15).

2. Selection and contracting of local (administrative tasks to be charged to Output 1.3 – see Budget Note C).
3. Recruitment of local labour among the resident population (administrative tasks to be charged to Output 1.3 – see Budget Note C).
4. Implementation of the construction works (to be charged to BL16).
5. Road works monitoring and supervision (to be charged to BL15).
6. Setting up a mechanism for maintenance (see below on sustainability) (technical expertise to support the process to be charged to Output 1.3 – see Budget Note C).

### Social, economic and environmental benefits

- It is estimated that 18,929 people (over 50% women) will benefit from improved access to urban infrastructure and services, facilitated conditions for evacuation and reaching higher grounds during a flood emergency;
- Around 3,000 people will benefit from improved drainage conditions, including the children that attend the College Privé Lova School;
- This project will be particularly beneficial to persons with disabilities and older persons living in the targeted neighbourhoods. Approximately 1,000 older persons living in the eastern neighbourhoods in Morondava will benefit from improved access to the hospital, evacuation routes and the safe haven. Tanambao and Andakaba are among the areas with the highest number of older persons in the city.

### Sustainability

Technical expertise will be hired to ensure that the road is designed and engineered for long-term use and in a resilient manner. Construction will be closely monitored to ensure a quality result. The Morondava City Council has accepted to commit annual funds for maintenance of all infrastructure built under the present project, while the project staff will ensure that city officials and technicians have acquired the capacity to do so through training delivery and monitoring.

Importantly, communities will be involved in the construction works as much as possible. Trainings will be delivered and information disseminated to the local population on basic maintenance practices and the importance on keeping the drainage ditches clean.

The following activities will be conducted to further support the maintenance and sustainability of the interventions:

- Raise awareness and deliver trainings about the relation between waste dumping, drainage capacity, flooding and diseases;
- Support the Morondava City Council in drafting and signing collective conventions between the municipality and communities on maintenance efforts.

### Design details

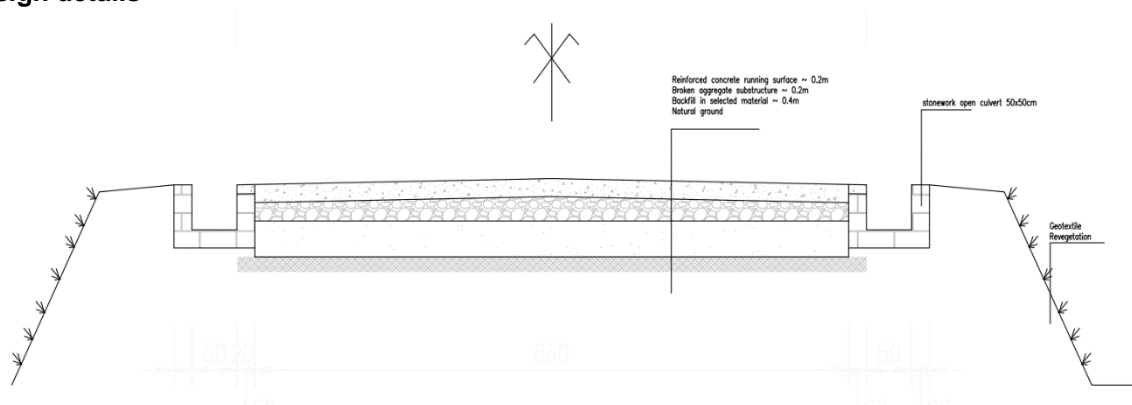


Figure 8: Sketches of cross-section of the road to be built



### **SUB-PROJECT FICHE 5.1.6: Reconstruction of 3 bridges connecting different neighbourhoods in a resilient manner**

#### **Overview**

Three bridges crossing the Hellot Channel (see location in Figure 7) will be reconstructed with reinforced concrete in the neighbourhoods of Tanambao, Ankisirasira Sud and Bemokijy: Tanambao bridge (length 16 m; width 3.95 m; elevation 1.45 m), Rapiera bridge (length 30 m; width 4 m; elevation 2.65 m) and Bemokijy Bridge (length 13 m; width 4 m; elevation 1.60 m). The Hellot channel, a secondary arm of the Morondava River formally used as transport and irrigation channel, passes through the southern neighbourhoods creating challenges for the population to circulate.

These bridges are crucial for mobility and especially important in case of an evacuation; however, they are currently in poor conditions and cannot be used by ambulances or fire trucks. They currently present a threat to the safety of the population due to their precarious state.

This sub-project aims to rehabilitate these 3 bridges, thus increasing the level of preparedness and response (evacuation) capacity in case of floods and/or cyclones and improving the overall mobility within the city. The alternative option of constructing a new road to circumvent the channel would not be cost-effective, resulting in more transportation costs (attributed to a longer travel distance) for the population, more complex work and higher construction costs.

#### **Implementation strategy and planned activities**

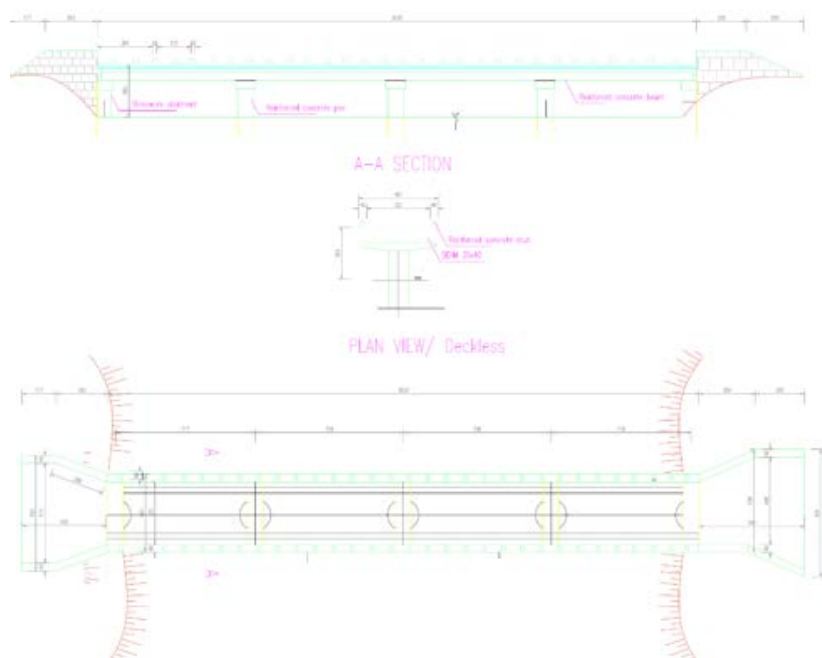


Figure 9: Preliminary sketches for rehabilitating the Rapiera bridge

Due to the precarious state of the 3 targeted bridges and the risk they currently present to the population, they will have to be demolished and re-built in a safer and more resistant manner. As much as possible, the unskilled workforce will be composed by members of the neighbouring communities using the labour-intensive approach successfully applied in Madagascar in other projects.

The planned activities for reconstructing the bridges are (for the budget references, please see **Annex 1**):

1. Preparation of detailed studies, including technical specifications, bills of quantities and detailed designs (to be charged to Output 1.1 – see Budget Note A and to BL17).
2. Selection and contracting of local contractor (administrative tasks to be charged to Output 1.3 – see Budget Note C).
3. Recruitment of local labour (administrative tasks to be charged to Output 1.3 – see Budget Note C).
4. Demolition of existing bridges and construction works (to be charged to BL18).
5. Bridges construction works monitoring and supervision (to be charged to BL17).
6. Setting up of maintenance mechanisms (see below on sustainability) (technical expertise to support the process to be charged to Output 1.3 – see Budget Note C).

#### **Social, economic and environmental benefits**

- Almost 11,000 people will benefit from improved connectedness between the neighbourhoods of Tanambao, Ankisirasira Sud, Ampasy and Bemokijy, facilitating circulation, access to basic infrastructure and services and thus, improving livelihoods opportunities. The population of these neighbourhoods are among the poorest in Morondava, with Tanambao and Ampasy having the

two highest poverty rates in the city (85% and 88% respectively), and will greatly benefit economically and socially from being better connected to the city centre and its main services.

- An estimated population of 8,246 people will benefit from facilitated access to the city centre and increased response/evacuation capacity during floods and cyclones, improving mobility for older persons (approximately 500 people) and persons with disabilities living in these neighbourhoods.

### Sustainability

Competent technical expertise will be hired to ensure that the bridges are designed and engineered for long-term use and enhanced resiliency to flooding impact. Construction will be closely monitored by the project staff to ensure a quality result. The Morondava City Council has accepted to commit annual funds for maintenance of all infrastructures built under this initiative, while the project staff will ensure that city officials/technicians acquire the needed capacity to do so through training delivery and monitoring. Maintenance efforts will also be promoted and incentivized by collective conventions signed between the municipality and local communities.

### **SUB-PROJECT FICHE 5.1.7: Enhancing the drainage capacity in the city centre**

#### Overview

This sub-project aims to improve the drainage capacity of the central neighbourhood (Morondava Centre) and the adjacent areas (Sans Fil, Andakabe and Andabatoara neighbourhoods) by cleaning/rehabilitating most of the existing drainage network and constructing a new drainage channel connecting the city centre to Sans Fil neighbourhood. The latter is currently not provided with a drainage system.



Figure 10: Location of drainage interventions

The historic city centre is where most of the services and infrastructure are located, while the surrounding areas host busy markets and businesses that populate the streets with inhabitants from all parts of the city. The existing drainage network in the targeted area is mostly non-operational due to lack of maintenance and cleaning (see figures 12). It is also not properly connected to neighbouring areas. The poor sanitation conditions resulting from the deficient drainage system in such a busy area of the city has put lives (i.e. health) and physical assets at high risk, especially during flood events. The total length of the channels to be cleaned and rehabilitated is 4,389 m (of which 3,584 m are covered channels and 805 m are opened channels). For this intervention will be used concrete, steel and waterproof plaster as main materials.

Meanwhile, regarding Sans Fil neighbourhood located next to Morondava Centre, a new drainage channel (length 305 m; section 0.50 m x 0.60 m) can be built at a reasonable cost and connected to the existing drainage system, thus improving considerably the evacuation of

rain/flood waters in such a poor/vulnerable neighbourhood.

#### Implementation strategy and planned activities

The drainage capacity of the area will be improved by cleaning/rehabilitating a total of 4,389 m channel

length and building a new channel of 305 m long (see location of these interventions in figure 10).

The planned activities for this sub-project are *(for the budget references, please see Annex 1)*:

1. Preparation of detailed studies, including technical specifications, bills of quantities and detailed designs *(to be charged to Output 1.1 – see Budget Note A and to BL19)*.
2. Selection and contracting of local contractor *(administrative tasks to be charged to Output 1.3 – see Budget Note C)*.
3. Recruitment of unskilled labour among community members *(administrative tasks to be charged to Output 1.3 – see Budget Note C)*.
4. Construction/rehabilitation/cleaning works *(to be charged to BL20 and BL21)*.
5. Drainage construction works monitoring and supervision *(to be charged to BL19)*.
6. Setting up a mechanism for maintenance (see below on sustainability) *(technical expertise to support the process to be charged to Output 1.3 – see Budget Note C)*.

### Social, economic and environmental benefits

- Approximately 18,255 people (particularly children and women) will benefit from improved drainage conditions in the target neighbourhoods, enhancing sanitation and reducing risks of floods and related disease outbreaks;
- Existing economic activities in the targeted area (mainly the city centre and immediate surroundings) will benefit from the reduction of flood impact and health hazards resulting from stagnant water and poor drainage conditions;
- Communities will be involved as paid labour in construction works and related maintenance, rehabilitation and cleaning needs; they are also provided with the required equipment to carry out the works.

### Sustainability

The required technical expertise will be hired to ensure the robustness of construction works and the efficiency of the cleaning/rehabilitation process for improving the drainage system of Morondava.

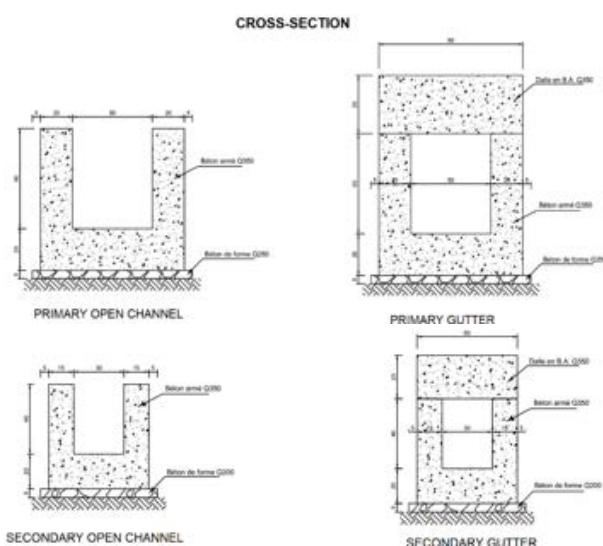


Figure 11: Design details of the drainage channel to be constructed

Construction will be closely monitored and supervised by the local project team. The Morondava City Council has accepted to commit annual funds for maintenance of all infrastructures built under the present project in cooperation with the resident population, while the project will build the required capacities and support the establishment of appropriate mechanisms for this to happen.

Importantly, communities will be involved in construction work when possible, particularly for the cleaning/rehabilitation activities. The sub-project will be carried out in parallel to awareness-raising campaigns to maintain basic services and infrastructure in the city, highlighting the importance of keeping the drainage ditches clean and the relation between waste dumping and clogging of ditches, flooding and diseases. Knowing that the drains regularly get clogged with waste, the related sub-project on solid waste management (see separate Sub-Project Fiche 5.1.8) is inherently linked to the sustainability of all drainage interventions.

The following activities will be conducted to further support the maintenance and sustainability of the interventions:

- Raise awareness and deliver local training sessions regarding solid waste management, drainage maintenance, flood risk reduction and prevention of disease outbreaks;
- Support the Morondava City Council in drafting and signing collective conventions between the municipality and communities regarding appropriate maintenance mechanisms.



## **SUB-PROJECT FICHE 5.1.8: Improving solid waste management in the city centre**

### **Overview**

The city of Morondava is currently facing a massive problem regarding the management of solid waste due to the overall lack of capacity of the city council and the weak awareness of the population on this issue. Less than 1% of the households dump their rubbish in waste containers, while more than 70% bury or throw it in uncontrolled dumpsites regardless of the waste origin, composition or toxicity.

Consequently 80% of the city's drainage system is clogged with waste, provoking the overflow of rain water and waste water. It is also important to note that the city has a dumpsite (Ampassy neighbourhood), but due to the lack of equipment, this site is not currently used. Therefore, it appears necessary to strengthen municipal capacity to tackle this issue by providing the necessary equipment and a sustainable strategy to properly manage solid waste, at least in proximity to the drainage channels which are going to be improved or built through the project (please see Sub-Project Fiche 5.1.7). The materials needed for this intervention are: waste collection tools (bins, wheelbarrow, etc.) and other equipment (gloves, broom, etc.), 1 waste truck, 4 main waste containers and 16 intermediary waste containers. This sub-project aims to set up sustainable solid waste management mechanisms in the city centre of Morondava by involving both municipal authorities and local communities (especially women), as well as providing the necessary equipment to ensure efficient and lasting implementation.

### **Implementation strategy and planned activities**

A capable local NGO will be hired to coordinate implementation and recruit workers among the community (especially targeting women) in the four targeted neighbourhood (Morondava Centre, Sans Fil, Andakabe and Andabatoara), to be organised as an association. More specifically, sanitation and hygiene community-based committees called RF2 (referring to "*Rafitra Fikojanaranosy Fahadiovana*") will be established. These RF2 committees will be in charge of collecting trash in intermediary and main waste containers at the community level, while the municipality will be responsible to transport waste from the main containers to the dumpsite. The RF2 will also take care of cleaning the drainage channels in the different concerned neighbourhoods under the supervision of the municipality.

The following activities are planned (*for the budget references, please see Annex 1*):

1. Selection and contracting of a local NGO for community mobilisation/engagement and delivery of waste management training (*administrative tasks to be charged to Output 1.3 – see Budget Note C*).
2. Diagnosis of sanitary conditions in each neighbourhood through community involvement (*to be charged mainly to BL23 and to BL25 for operational costs as such as transport, fuel, communication, etc.*).
3. Identification and establishment of intermediary and main waste collection points through technical and specialised waste management assistance (*to be charged to BL22*).
4. Establishment of the RF2 committees in the target neighbourhoods (*to be charged to BL23*).
5. Development of a solid waste management work plan by the municipality in collaboration with the RF2 committees, including collection circuits, equipment management, maintenance and financial mechanisms through on-site technical assistance and waste operations monitoring and supervision (*to be charged to BL22*).
6. Purchase and distribution of waste equipment for the community including gloves, protective shoes/clothes, plastic bags, rakes, etc. (*to be charged to BL23*) and one waste truck for the municipality (*to be charged to BL24*).
7. Training of RF2 committees by the locally hired NGO (*to be charged to BL23*).
8. Cleaning of the drainage system and waste collection sessions before and after the rainy season during the establishment and institutionalisation of RF2 committees (*to be charged to BL23*).

The establishment of the RF2 will be progressive, to allow monitoring and evaluating the implementation process. This approach will give the opportunity to highlight lessons learnt and steer the sub-project implementation progress.

### **Social, economic and environmental benefits**

- Approximately 120 persons (with a focus on women) will be recruited for cleaning regularly the rehabilitated/re-constructed drainage system; Employment and working conditions will follow ILO standards;
- Waste collection points will be selected in a participatory manner including community-based committees, ensuring the participation of marginalized and vulnerable groups and adopting a

gender sensitive approach. Particular attention will be given to the accessibility, safety and suitability of the locations;

- The city centre will be cleaner and the drainage system's efficiency preserved, hence with important benefits in terms of public health;
- The city centre will become more attractive for investments/small businesses.

### **Sustainability**

For a successful solid waste management intervention, the city of Morondava has to tackle the population behaviour regarding this issue. This is why the intervention will focus on one important objective: obtain the maximum involvement of local communities to ensure a lasting and sustainable collection of waste. To do so, training and awareness raising activities will be conducted in each neighbourhood and community workforce will be mobilize to guarantee the appropriation and institutionalisation of good practices at the local level.

- Elaborate charters of responsibility between the municipality and the community committees in a participatory and collaborative process;
- Strengthen municipal department and community committees (RF2) for solid waste management;
- Carry out monitoring and evaluation of the results of each phase of RF2 implementation to improve the following phases;
- Train the city council to efficiently manage, budget and allocate the necessary resources to solid waste management;
- Carry out awareness raising campaigns and trainings of the population through community committees and local leaders for appropriate waste management practices.

## 5.2. CITY: ZOMBA, MALAWI

### **SUB-PROJECT FICHE 5.2.1: Establishment of a city-wide early warning system for floods**

#### **Overview**

Currently, the city has two existing but out-dated weather stations. There is no early warning system (EWS) for flooding in Zomba. Early warning information is currently not being timely transmitted to the vulnerable communities, which are caught by surprise when flooding occurs.

To ensure that people are safe in times of floods, an integrated early warning system for floods needs to be set up, including upstream automated river gauges and sirens that can alert the entire population of Zomba. Marked escape routes will lead people safely to the evacuation centres which are going to be built through Sub-Project 5.2.2.

#### **Implementation strategy and planned activities**

The following activities are planned (*for the budget references, please see Annex 1*):

1. Carry out a stakeholder analysis to understand who are the best placed people/institutions to operationalize in an efficient and effective manner the EWS in Zomba (*to be charged to BL26*).
2. Provide technical assistance for setting up the early warning system (EWS) in Zomba, including design, training and supervision (*to be charged to BL26*).
3. Rehabilitate and modernise two existing weather stations, including materials upgrade and automated measuring system (*to be charged to BL27*).
4. Install automated water gauges and sirens in appropriate locations along the Mponda, Naisi, Mulunguzi and Likangala Rivers which are crossing the city (*to be charged to BL28*).
5. Develop a communication strategy and train stakeholders on the use of the weather stations, water gauges and warning mechanism (*to be charged to BL29*).
6. Identify and mark escape routes (see Sub-Project 5.2.2)
7. Train and equip EWS operators (*to be charged to BL30 and BL31*).
8. Raise awareness and conduct trainings (regular drills) (*to be charged to Output 1.3 – see Budget Note C and to BL29*).

The project is based on the lessons learned and activities undertaken from previous projects. LEAD International reported an instance of community-supported river level monitoring on the Likangala River which demonstrated some success. It was discussed in the project formulation stage whether this may be replicated at various identified locations upstream, through formal community involvement, for an agreed monthly fee. It was found that this solution may be successful in monitoring river levels to indicate the propensity for a fluvial flood event. However, two limitations were found: (i) overnight flooding might not be monitored nor reported; and (ii) rapid events caused by flash flooding may not be detected timely. As a consequence, the use of automated water gauges is proposed, provided with tamper-proof protection to ensure continuity of utility.

The automated system will be coupled with meteorological measurements and monitoring. Two weather stations already exist in Zomba, which need to be rehabilitated and modernised: one at the premises of Chancellor College and one at LEAD International.

As a recommendation taken up from the DFID funded Enhancing Communities' Resilience Programme (ECRP) 2011-2017 project (see also Part II, section G), weather forecast information is crucial and partners are advised to link up with the Department of Climate Change and Meteorological Services (DCCM) in the Ministry of Natural Resources, Energy and Mining through the Malawi Weather Forum for updates. There is need to ensure information is shared in a manner that is timely and "actionable" and also to integrate people, processes and technologies to drive optimal benefits in weather forecast and use.

A chain of multi-layered communications will be set up to maximise the reach. The project will link the EWS to an existing community radio channel, namely Chanco Radio, which will help to disseminating the early warning messages. Part and parcel of the overall implementation strategy will hence be to make maximum use of youths in disseminating weather-related forecasts. This has been included as a lesson learnt from the above-mentioned ECRP funded by DFID. It was highlighted that youth interventions such as drama enhanced uptake of information and use in disaster preparedness. Therefore, a careful stakeholder analysis is needed at the start of this sub-project to discern the best way to secure youth participation for the long-term success of the initiative. The proposed project will involve youth groups in the communication strategy, trainings and drills for the EWS.

Some escape routes already exist but they need to be further identified and marked, so that people unfamiliar with the terrain will be safe in times of floods. Under sub-project 5.2.2 these will be improved.

### Social, economic and environmental benefits

- The EWS will ensure that people, and especially the most vulnerable groups (see **Annex 2** for data and information on marginalized and vulnerable groups in Zomba), are safe in time of floods;
- People are warned of extreme weather events well in advance and can take measures to protect their livelihoods and lives;

### Sustainability

- For a sustainable use and functioning mechanism of the EWS, overall responsibility for the EWS and related equipment will be given to Zomba City Council in partnership with the Chancellor College and LEAD International;
- Municipal technicians and all stakeholders will be trained on the use of the EWS related equipment (e.g. hydrometric and pluviometric material, weather stations and water gauges);
- A communication strategy, awareness raising and regular drills are also a crucial component to the sustainability of the mechanism; in particular, the automated river gauging station and sirens need to be maintained through the deployment of adequate technical expertise, and protected from eventual acts of vandalism; that is why it is crucial to involve surrounding communities in the process, so that everybody understands the need for these stations/sirens.

## **SUB-PROJECT FICHE 5.2.2: Construction of multi-purpose evacuation centres**

### Overview

The sub-project will focus on the construction of three (3) multi-purpose evacuation centres and the improvement of evacuation routes from flood prone areas to these centres. The latter will be built in Likangala, Chambo and Sadzi wards as shown in Figure 1.

When floods occur, houses are destroyed or rendered uninhabitable because they are poorly constructed and/or because of their location in flood prone areas, thereby displacing many people. There are no purpose-built safe havens (evacuation centres) established for hosting the displaced people, who generally converge in the nearest schools, causing disruption to learning by children. Additionally, these ad-hoc evacuation centres are beset by sanitation, security/safety and health issues considering the number of people they can host during a flood emergency.

### Implementation strategy and planned activities

The city council in partnership with the concerned communities will oversee the development of the evacuation centres and their respective evacuation routes. The construction of these facilities will be done by a local contractor following a competitive bidding process. The city council's Engineering Department will be responsible for the technical supervision and communities will be involved in the project monitoring. Environmental-friendly building materials, such as stabilized soil blocks, will be utilised for construction as opposed to the commonly used burnt bricks. The contractor's labour force will be hired as much as possible among the local population, and will follow national labour laws which are based on ILO standards. The evacuation routes rehabilitation will be carried using labour intensive method involving local communities. The evacuation centres, once completed, will be handed over to the respective communities through their

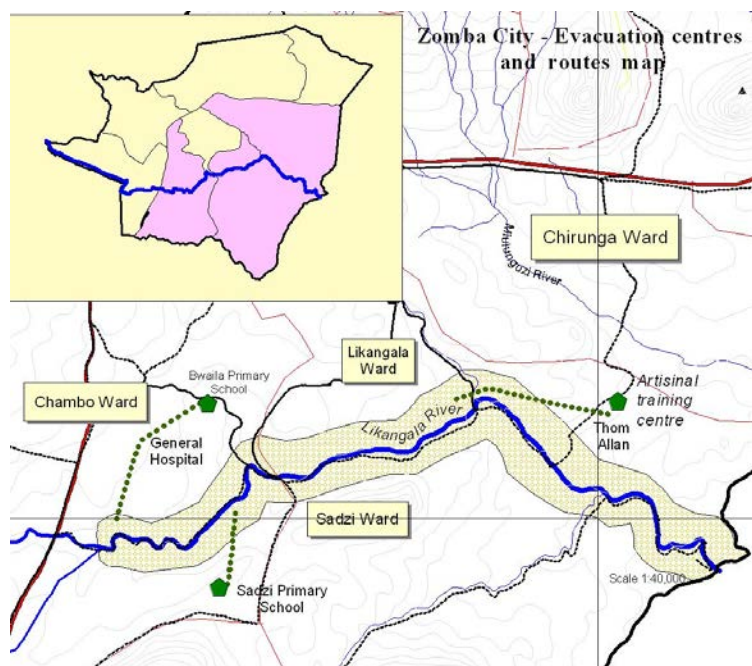


Figure 1: location of the evacuation centres/routes (green pentagons/dotted lines)

elected centre management committees for the day to day management of the facilities. The city council will be the legal owner of the centres but will work closely with and support the centre management committees.

The following activities will be undertaken (*for the budget references, please see Annex 1*):

1. Preparation of detailed evacuation centre and routes designs through participatory approach with the concerned communities (NB: particular attention will be given to the concerns of women, older persons, children and the most vulnerable), including bill of quantities and all technical specifications (*to be charged to Output 1.1 – see Budget Note A and to BL32*).
2. Competitive tender process to identify local contractor (*to be charged to Output 1.3 – see Budget Note C*)
3. Construct evacuation centres (*to be charged BL33, BL34, BL35 and BL36*).
4. Improve evacuation routes from disaster prone areas to evacuation centres (*to be charged to BL37*).
5. Establish and train centre management committees (*to be charged to BL38*).
6. Set up and train a bicycle ambulance for use in times of floods (*to be charged to BL38 and BL39*).
7. Deliver additional training activities (*to be charged to BL38 and to Output 1.3 – see Budget Note C*).

During the community consultations (see Part II, Section I), community members expressed that the evacuation centres must have separate rooms for girls and adult women, for boys and adult men, male and female toilets, kitchen and a room which can be used for treating common ailments for displaced persons and for receiving ARVs for displaced persons with HIV/Aids. Many of these recommendations are in line with the lessons learnt from evacuation centres built in other districts in Malawi notably in Chikwawa and Salima districts.

Last but not least, during the local consultation with vulnerable people it was requested that bicycle ambulances are set up to ensure that persons with disabilities, old and sick people can be evacuated in times of disaster. Communities mentioned that vehicles often cannot access narrow and informal roads, hence bicycles were recommended for evacuation.

### **Social, economic and environmental benefits**

- Purpose-built evacuation centres with functional and trained management structures will offer protection and safety to the most vulnerable of the displaced especially women, girls, older persons, people with physical disabilities and the chronically sick;
- A total of 30,871 people will benefit from the centres. This figure includes up to 900 displaced persons at any one time who would otherwise end up in schools with undignified living conditions or who would have ended up crowding with relatives and friends will now live in reasonable dignity in the transition period to recovery; it includes up to 8,000 learners in the three schools that are used as ad hoc evacuation centres will not have their education interrupted during disasters on account of their schools being occupied by displaced people; it also includes others who will benefit from various capacity building activities and community based activities.
- When there are no disasters the centres will be used for other purposes, such as training and capacity building, as well as other community activities thereby increasing the communities' social capital and assets;
- Displaced persons will have secure, safe and sanitary environment to live in during their period of displacement;
- The construction will use sustainable building materials and technologies to reduce dependence on burnt bricks;
- During the community consultations, members of the community and especially older persons and those with physical disabilities bemoaned access difficulties to safe havens due to rugged routes. The planned improvements to the evacuation routes will ease access to the evacuation centres for all including older persons and people with physical disabilities. In addition, bicycle ambulances will ensure that persons with disabilities and older persons can reach safe areas, as they recommended during the local consultations.

### **Sustainability**

The community consultations discussed the question of what will be done with the evacuation centres when they are no displaced persons. It was unanimously agreed that the communities will put them to use to serve community interests such as the above-mentioned training activities, early childhood



- A community management committee will be established for each evacuation centre to foster community ownership thereby ensuring good care of the facility;
- Climate proofing construction techniques will be utilised for the centres and the evacuation routes;

[illegible]

**SUB-PROJECT FICHE 5.2.3:** Rehabilitation of existing drainage channels and construction of new drainage channels

### Implementation strategy and planned activities

1. Preparation of detailed studies, including technical specifications, bills of quantities and detailed designs (*to be charged to Output 1.1 – see Budget Note A and to BL40*).
2. Selection and contracting of local contractor (*administrative tasks to be charged to Output 1.3 – see Budget Note C*).
3. Recruitment of local labour (*administrative tasks to be charged to Output 1.3 – see Budget Note C*).
4. Construction works (*to be charged BL41, BL42, BL43 and BL44*).
5. Drainage construction works monitoring and supervision (*to be charged BL40*).
6. Setting up a mechanism for maintenance (see below on sustainability) (*technical expertise to support the process to be charged to Output 1.3 – see Budget Note C*).

## Social, economic and environmental benefits

Approximately 63,760 people will benefit from these drainage improvement interventions. Assets (housing, schools, etc.) and infrastructure will be protected from destruction/damage from flooding. Same for agricultural areas and urban gardens, which are important for livelihoods and well-being of the citizens. Urban flood risk will be reduced, overall. Communities will be involved as paid labour in construction works and related maintenance and cleaning needs

## Sustainability

The drains will be designed and engineered to ensure that they are robust. The Zomba City Council (ZCC) is the roads and drainage authority within the city jurisdiction and will be responsible for maintenance of infrastructure from its regular budget once the project infrastructure is handed over to the city. Under its regular budget, ZCC has committed USD45,000 for the financial year 2017-18 for those kinds of maintenance activities.

Knowing that the drains regularly get clogged with waste, the related sub-project on solid waste management (see Sub-Project Fiche 5.2.4) is inherently linked to the sustainability of all drainage interventions.

The following activities will be conducted to further support the maintenance and sustainability of the interventions:

- Raise awareness and conduct trainings about the relation between waste dumping, flooding and diseases;
- Support Zomba City Council in drafting a city-wide sanitation policy and city-wide by-laws (which will guide community development committees on drafting community by-laws to ensure, inter alia, that drainage is protected from indiscriminate dumping).

## Maps and design details

### 1) Mtiya ward

The project site at Mtiya ward is located directly under the Zomba plateau. Heavy downpours on the plateau slopes cause rainwater to aggregate into smaller streams, some of which leading directly to the Mtiya community. As a result, local roads turn into water streams, flooding local dwellings. The affected community is located on a hill itself. Two natural waterways are located next to this hill. A school is located at the foot of the hill.

To control the water flow downwards a high capacity drainage interceptor ditch is proposed, preventing flood waters to enter the community and guiding it to the two water streams that run parallel to the hill and away from the local school. This solution maximises the number of beneficiaries and mitigates the risk of overflowing of a roadside drain with limited capacity. The course of the two parallel water streams has been assessed for negative downstream effects, which are null because of the sparse density downstream and the limited effect on water flows. Ultimately the water streams confluence with the Likangala River.

The location of the ditch was chosen based on spatial constraints related to the existence of local roads/street and houses. During the construction phase, the drainage channels location will have to be evaluated in the detail; however, according to this preliminary location proposition, there is no need for displacing households or reallocating plots from the current occupants.

From a technical perspective, the location of the proposed ditch is reserved to be placed in public land and aligned along the existing roads. Figure 2 indicates a potential location for the referred drainage. Culverts will have to be installed to overcome intersections with local roads. Based on a catchment area of 140,000 m<sup>2</sup>, and a rainfall intensity of 150 mm/h, the calculated required capacity of the drainage



Figure 3: Conceptual design of Mtiya ward intervention

interceptor ditch (**in magenta in figure 3**) is 3,500 litre/s. The resulting section surface of the drain, based on a velocity of 1.5 m/s, is 2.33 m<sup>2</sup>. The ditch will be constructed in reinforced concrete, local masonry and would require culverts.

Based on a catchment area of 25,000 m<sup>2</sup>, and a rainfall intensity of 150 mm/h, the calculated required capacity of the roadside drain next to the school (**yellow line in figure 3**) is 833 litre/s. The resulting section surface of the drain, based on a velocity of 1.5 m/s, is 0.49 m<sup>2</sup>. The ditch will be constructed in reinforced concrete, local masonry and would require crossover slabs for vehicles to pass the ditch.

Drainage A-A' Cross-section (area = 2,3 m<sup>2</sup>)

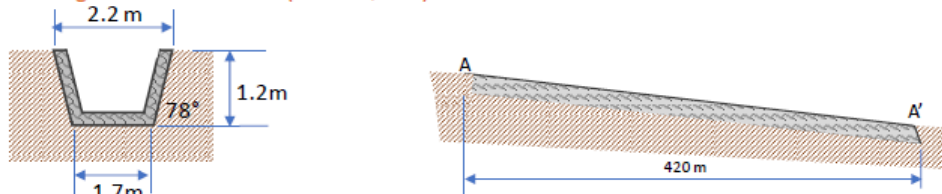


Figure 4: Drainage cross-section

The site at Sadzi ward is located under Sadzi Hill and includes Mkwezule, a tributary river to the Likangala. The Mkwezule River runs through a natural wetland, lined with sugarcane. Local inclination made the river to erode the river bed, leading to a cycle of river bank collapse and discharge obstruction.

Flooding occurs during and after heavy downpours when runoff from Sadzi hill reaches the lower parts of the Sadzi community.

The construction of local roadside drains is proposed to guide runoff to the Mkwezule River. Further, to prevent further collapse of the Mkwezule riverbank, the reconstruction of local river banks is proposed, including the installation of check dams to limit erosion in sections where local inclination exceeds 2 degrees. For the sections with steep slopes inclination and narrower channel width, the use of gabions or rocks masonry is suggested for channel stabilisation. During the implementation or pre-implementation phase a detailed assessment should be conducted to select the specific location where such measures can be adopted.



Figure 5: Proposed drainage segments locations (yellow lines) at Sadzi site; natural drainage rehabilitation segment (purple); and schools adjacent (green)

The higher parts of Sadzi community (**indicated in a red circle and white “?” in figure 5**) do not suffer from flooding because of its natural terrain elevation relative to the surrounding lands.

Based on a catchment area of 30,000 m<sup>2</sup>, and a rainfall intensity of 150mm/h, the calculated required capacity of the roadside ditches (**in yellow solid line in figure 5**) is 625 litre/s. It is proposed to line both sides of the roads with a ditch of 312.5 litre/s each side. The resulting section surface of each drain, based on a desired velocity of 1.5 m/s, is 0.21 m<sup>2</sup>. The drains would need flow control structures (check dams) to limit flow velocity and control gully erosion.

Based on a catchment area of 260,000 m<sup>2</sup>, a rainfall intensity of 150 mm/h and an upstream discharge of 6,250 litres/s, the calculated required capacity of the Mkwezule River (**magenta line in figure 5**) is 12,750 litre/s. The resulting average section surface of the river, based on a desired velocity of 1.5 m/s, is 8.5 m<sup>2</sup>. The river would need flow control structures (check dams) to limit flow velocity and control erosion.



### 3) Chinamwali ward

Chinamwali ward is the densest area in Zomba and experiences regular flash flooding originating from the Chinamwali Hill. A market and a school are within the flood extent area. The construction of a drainage system illustrated in figure 7 is proposed to alleviate flash flood risks.

Based on a catchment area of 50,000 m<sup>2</sup> and a rainfall intensity of 150 mm/h, the calculated required capacity of the down drains (in yellow and blue vertical lines in figure 6) is 1,250 litre/s. The resulting



Figure 6: Proposed locations and conceptual design of drainage intervention in Chinamwali

section surface of each drain, based on a desired velocity of 1 m/s, is 0.83 m<sup>2</sup>. The drains would need flow control structures (check dams) to limit flow velocity and control erosion, and crossover slabs.

Based on a catchment area of 20,000 m<sup>2</sup>, a rainfall intensity of 150 mm/h, the calculated required capacity of the roadside drains (yellow and blue horizontal line in figure 6) is 500 litre/s. The resulting section surface of each drain, based on a velocity of 1 m/s, is 0.5 m<sup>2</sup>. The drains will have to be equipped with crossover slabs.

Based on a catchment area of 120,000 m<sup>2</sup>, a rainfall intensity of 150mm/h, the calculated required capacity of the main drains (yellow horizontal line in figure 6) is 2,500

litre/s. The resulting section surface of each drain, based on a velocity of 1.5 m/s, is 1.7 m<sup>2</sup>. The drains would need flow control structures (check dams) to limit flow velocity and control erosion, and crossover slabs.

Figure 7 presents more detail about the main features encountered at the site during the site visit as well as a conceptual design for the proposed interventions.

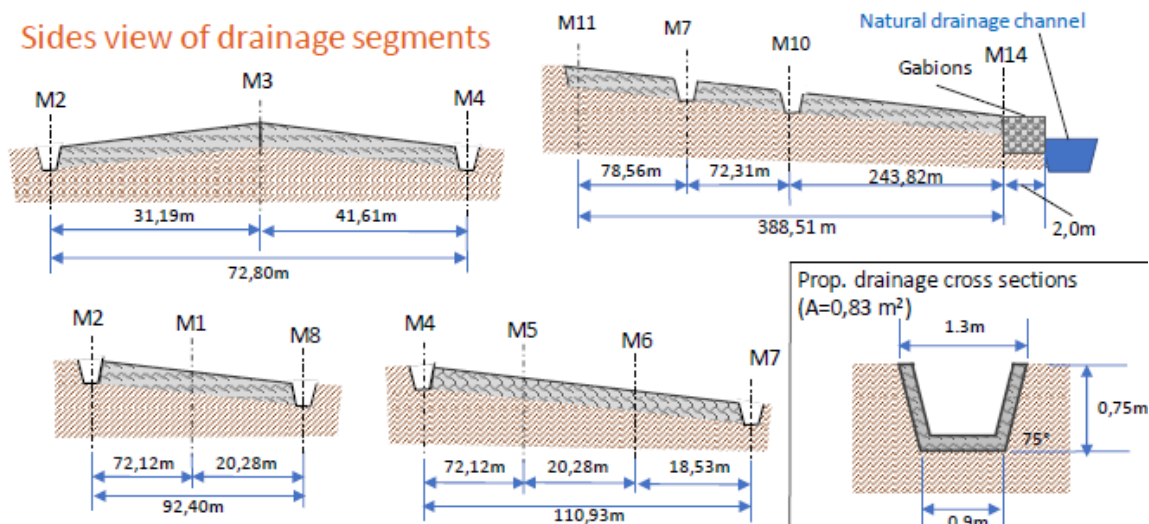


Figure 7: Side view of drainage segments

### 4) Masongola ward

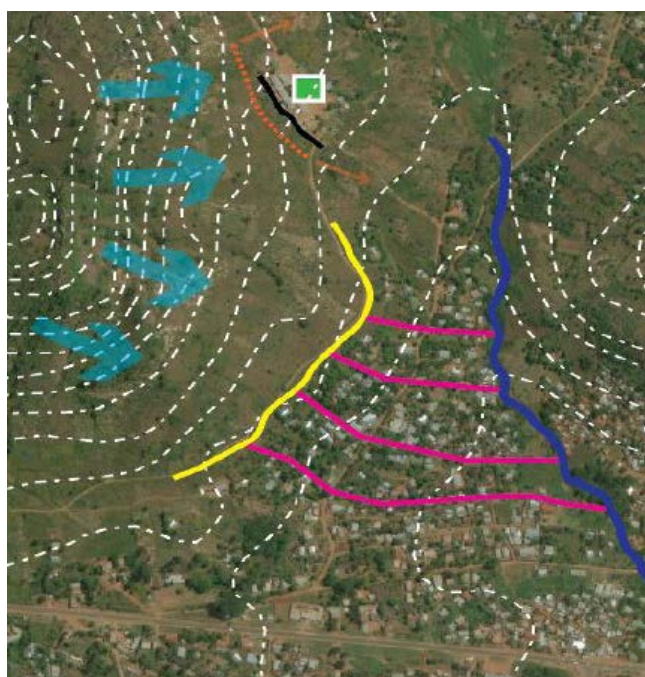
Ndangopuma School is located on Ndangopuma Hill in Masongola ward, and experiences regular flash floods. Existing drains (black line in figure 8) are insufficient to intercept and drain accumulated storm water.

The local community south of the school also suffers from violent flash floods coming down the hill. To reduce flash flood risk, a drainage system is proposed to control water flows from Ndangopuma Hill, guiding it to the natural water stream to the east.

Based on a catchment area of 30,000 m<sup>2</sup>, and a rainfall intensity of 150 mm/h, the calculated required capacity of the drainage interceptor ditch (**orange dotted vertical line in figure 8**); see example in figure 8) is 625 litre/s. The resulting section surface of each drain, based on a desired velocity of 1 m/s, is 0.63 m<sup>2</sup>.

Based on a catchment area of 60,000 m<sup>2</sup>, a rainfall intensity of 150 mm/h, the calculated required capacity the roadside drain (**yellow vertical line in figure 8**) is 1,250 litre/s. The resulting section surface of each drain, based on a velocity of 1 m/s, is 0.63 m<sup>2</sup>.

Based on a catchment area of 60,000 m<sup>2</sup>, a rainfall intensity of 150 mm/h, the calculated required capacity of each the down drains (**magenta horizontal lines in figure 8**) is 1,250 litre/s. The resulting section surface of each drain, based on a velocity of 1.5 m/s, is 0.83 m<sup>2</sup>. The drains would need flow control structures (check dams) to limit flow velocity and control erosion, culverts, and crossover slabs.



LEGEND:

- School interceptor drainage channel
- Side road drainage channel
- Secondary drainage channels

Figure 8: Proposed drainage segments locations (dark blue lines) at Ndangopuma school (1,585 pupils)

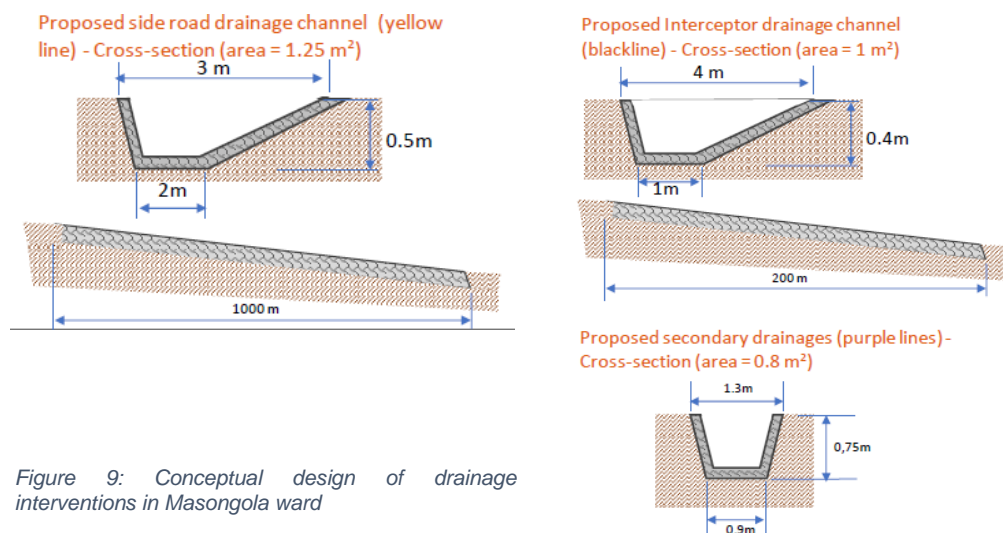


Figure 9: Conceptual design of drainage interventions in Masongola ward

## SUB-PROJECT FICHE 5.2.4: Improving solid waste management

### Overview

The city of Zomba has a projected 2017 population of 156,000 and growing at 3% per annum. The rate of waste generation is 0.44kg per capita per day translating to 68,640kg (68.64 tons) of waste generated per day for the whole city.

The traditional method of collecting waste in Zomba City is door to door collection using the city council refuse collection vehicles. This method is only able to reach 30% of the city's population residing mostly in low density, accessible, middle to high income areas. Currently the city council has only one



operational vehicle for waste collection purposes. Up to 70% of the population live in informal and less accessible settlements and do not benefit from any municipal waste management service.

Up to 80% of waste is organic in nature, whose putrefaction can produce a bad smell thereby creating public nuisance as well as being unsightly. This also encourages the multiplication of diseases through contamination of food and water sources. The rest of the waste generated is non-biodegradable mostly plastic bottles, plastics and glass. For people residing in Sadzi, Mtiya, Masongola and Chinamwali wards, which are located in hilly areas, the indiscriminate dumping of waste as well as naturally occurring siltation, blocks drainage and causes localised flooding. Some of the drainage is natural (gullies) but most of it is informal and not engineered, resulting in localised flooding and increased soil erosion and degradation in these wards. Flooding not only puts at risk private property but also public infrastructure including schools and roads. Improving drainage (see Sub-Project Fiche 5.2.3) and ensuring that the drains are functional and effective requires that they are kept clear from waste. To ensure that the drainage interventions proposed under a complementary sub-project in Zomba is effective, functional and sustainable, addressing waste management will be critical.

### Implementation strategy and planned activities

The sub-project will adopt a community-based approach to waste management in partnership with the city council, which will have several advantages: (i) it will increase cost-effectiveness; (ii) it will allow reaching communities who could not be reached otherwise, due to (among other aspects) lack of vehicular access; (iii) it has the potential of empowering the poor and vulnerable through creation of wealth from waste.

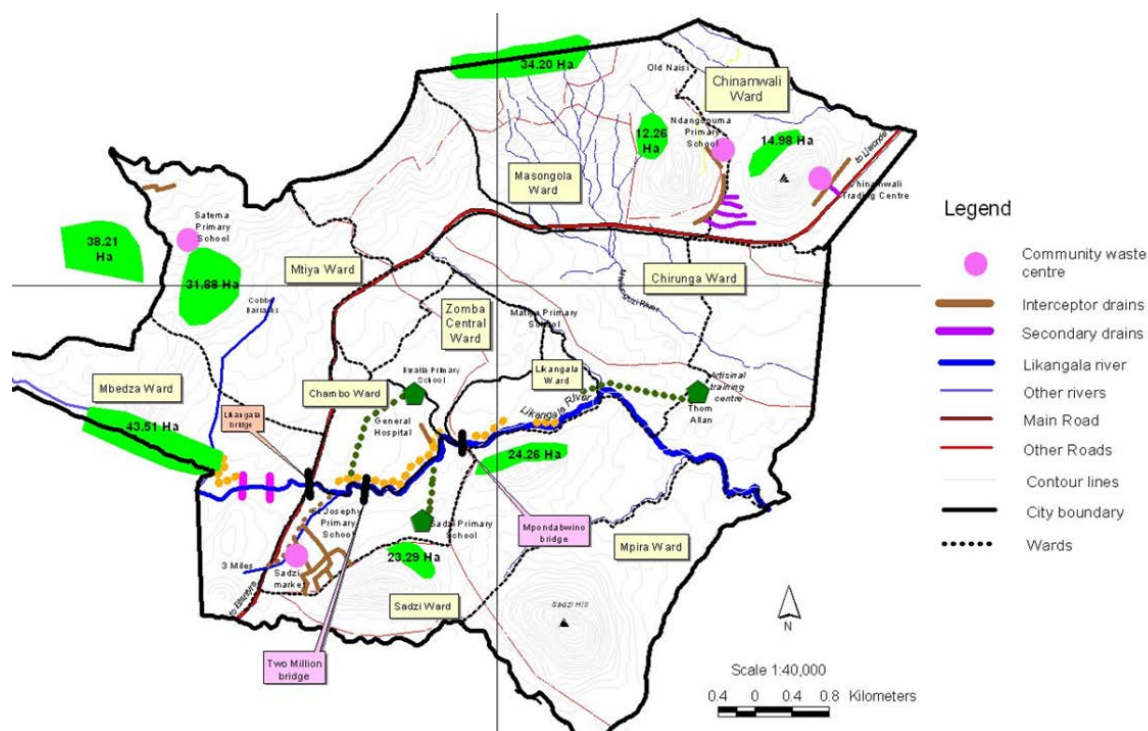


Figure 10: proposed location of the community waste centres in Zomba (magenta circles)

Integrated with the related drainage interventions, community action to keep drains clear by eliminating indiscriminate waste dumping will be important to the interventions' effectiveness and sustainability. This sub-project will be implemented through the establishment of community waste management centres in strategic positions in the city, namely in Sadzi, Mtiya, Masongola and Chinamwali wards (see map in figure 10), where drainage interventions are planned under this project proposal.

The community waste management centres will include: (a) perimeter fencing; (b) a composting/recycling shed; (c) a paved area for sorting and storage; (d) a small office; and (e) a toilet and shower room (see figure 2). The construction will use cement blocks as opposed to the commonly used burnt bricks in order not to contribute to deforestation. Each of them will serve maximum 1,000 direct beneficiaries. The costs related to the construction activities have been determined per facility/centre (see BL45, BL46, BL47, BL48, BL49 and BL50 in Expected Output 1.2, **Annex 1**).

Once built, the city council will retain the legal ownership of the facility but under a partnership agreement with the community waste entrepreneurs (CWE – which could be identified through existing saving groups, for example, often mainly composed of women) in each of the four target wards. Under this agreement the CWE groups will be responsible for the usage and maintenance of the centre and its equipment, including accountability, while the city council will provide bulk services (water, electricity) and security.

The partnership agreement will also recognise and authorise the CWE groups to carry out primary waste collection in the wards involving house to house collection using hand carts and/or wheel barrows. They will then bring the waste to the community waste management centre where it will be sorted and separated for composting, recycling and for onward transfer to the municipal landfill site. In these four wards the city council will only be involved in secondary waste management i.e. collecting waste that can neither be composted nor recycled from the community waste management centres to the municipal landfill site.

The activity entails the provision of technical assistance to the council and to communities. The costs entail hiring qualified consultant/facilitators for the definition of the waste management plan and operations, and the development of the legal partnership agreement between the city and the communities (*these costs will be charged to Output 1.1 – see Budget Note A in **Annex 1** and to BL45*).

Since Zomba City Council has currently only one functional refuse collection vehicle, the idea is to procure a second vehicle through this sub-project for servicing the community waste management centres (*the costs related to the purchase of the vehicles are included in BL52, Expected Output 1.2, **Annex 1***).

Importantly, handling waste can be a hazardous activity with the ever present threat of infection and injury. All waste handlers will be trained in the safe handling of solid waste and provided with protective clothing to prevent waste/body contact. Washroom with shower will be built in each centre to enable waste handlers wash themselves before they leave the premises. The centres will have security fencing to prevent unauthorised entry. The costs of protective waste equipment as gloves, protective shoes/clothes and soft equipment have been determined per centre (*see BL51 in Expected Output 1.2, **Annex 1***).

Finally, several capacity building activities will be carried out, in particular (*for the budget references, please see **Annex 1***):

1. Technical training in waste management/handling and in business management for the CWE groups (*to be charged to BL45 and BL53*).
2. Awareness-raising for promoting the understanding of the climate change/waste management/floods nexus, and explaining how indiscriminate dumping of waste blocks drains; graphic materials will also be developed for this purpose (*to be charged to BL45 and BL54*).
3. Support to the development of a municipal sanitation policy from which municipal by-law and community level by-laws will be subsequently developed; importantly, the policy will respond positively to women's interest to become local service providers (*to be charged to BL45*).

### **Social, economic and environmental benefits**

- Environmental: the city of Zomba will benefit from a reduction of garbage and subsequently of air and ground pollution, resulting in a cleaner city and increased awareness of the environmental impact caused by non-managed waste; the interventions carried out on the drainage system under Sub-Project 5.2.3 will become more sustainable as the overall drainage efficiency will be maintained;
- Social: the communities living in the 4 targeted wards will benefit from reduced exposure to environmental and health risks thanks to proper waste management and improved social cohesion resulting from the establishment of the CWE groups; the estimated number of direct beneficiaries is 4,000 (max. 1,000 beneficiaries per centre), and indirectly 36,060 (17,688 females and 18,392 males).
- Economic: (i) the CWE groups will benefit from increased economic opportunities as a result of the partnership with the city council concerning waste collection; (ii) increased safety for small-informal business (usually women managed) due to the reduction of local flooding.

### **Sustainability**

- The establishment of a formal partnership between the city council and CWE groups will protect and guarantee the operators and ensure municipal support;

- Training of the beneficiaries on compost making, recycling, arts and crafts and other administrative and business skills will provide knowledge and skills which can be sustained beyond the project lifespan;
- Marketing and developing markets for products made from waste will ensure the sustainability of the initiative;
- Increased community understanding of the climate change/waste management/floods/disease nexus will build strong community support for the initiative;
- The possibility to link CWE groups to microfinance institutions/saving groups will help expansion and diversification of the initiative;
- The integrated nature of the interventions involving drainage, waste management, value addition and increased incomes from waste will reinforce each other and contribute to sustainability;
- The city council has both a waste management and a vehicle maintenance budget, which will support the sustainability of the activities and the equipment bought under the sub-project.

### **Lessons from similar projects**

Community-based waste composting centres have been established in Lilongwe and Mzuzu cities in the past. The Lilongwe Waste for Wealth project funded by UNDP and implemented by UN-Habitat between 2009 and 2012 (see Part II, Section G) promoted a pro-poor public private partnership that supported women groups to establish a business that adds value to waste through composting and recycling and partnership with private sector buyers of the products. A similar initiative in Mzuzu was implemented under the EU funded Participatory Slum Upgrading Programme between 2015 and 2016. Two waste transfer stations have been established in Lilongwe with support from Water Aid and EU funding. These are the main lessons learned:

- Identifying markets for composting and recycling products is fundamental to the sustainability of this kind of initiatives. This must be done from the design/planning stage.
- Putting communities at the centre of the initiatives is cost-effective for the council and empowering for the poor and vulnerable who now have an income.
- Site selection for the centres is potentially problematic as no one wants to have a waste centre in their backyard. In Lilongwe and Mzuzu the sites already belonged to the respective city councils but community involvement in identifying the sites was important for reaching consensus and garnering community support for the project.
- There is a danger that if the secondary collection by the city council does not match the rate at which the waste is brought to the waste community centres, the latter can themselves start looking like landfill sites. It is therefore important to ensure that the council has adequate capacity for moving waste. That is why it is crucial to acquire a municipal waste truck through this sub-project.
- The inability of city councils to provide waste receptacles to households makes separation at source difficult for poor households who cannot afford receptacles for different types of waste.

### **SUB-PROJECT FICHE 5.2.5: River-focused interventions to prevent erosion and flooding**

#### **Overview**

The focus area lies beneath a mountainous region, with elevated areas including the Zomba plateau. Consequently, intensive rainfall leads rapidly to runoff accumulation into the Likangala River. Deforestation aggravates the amount and speed of runoff. Velocity can be very high after excessive rainfall. The catchment area reacts rapidly to any onset of precipitation.

In the main Likangala River and related flood-prone areas (i.e. located in Mbedza, Chambo, Sadzi and Likangala wards), this sub-project will tackle river bank erosion (also favoured by informal sand mining), gully building and/or growth and soil degradation through river-focused interventions as the installation of gabion baskets at identified hotspot areas (see map in figure 11).

The shape of the river valley is relatively steep and surrounded by settlements, most of which are informal and built into the river bed. Therefore, reactivating old meanders is not expected to create an increased hydraulic capacity and nor lower the extreme water levels of the Likangala River. Alternative interventions have been assessed as well, and those that may serve to reduce the water levels are not considered to be suitable, such as creating a bypass or enhancing its retention capability through dredging.

## Implementation strategy and planned activities

The overall planned activities for the drainage interventions are *(for the budget references, please see Annex 1)*:

1. Preparation of detailed engineering studies and designs, as well as bills of quantities. This will involve the installation of gabion baskets for a cumulative length of 300 m (approx. 1,780 gabion baskets), which will require: terrain measurement and inspection, including on site assessment to specifically determine the river sections in more detail, and calculating the exact grain size of the stones in the gabions vis-à-vis the velocity of the river *(to be charged to Output 1.1 – see Budget Note A and to BL55)*.
2. Selection and contracting of local contractor *(to be charged to Output 1.3 – see Budget Note C)*.
3. Recruitment of local labour among the communities living in the river banks *(to be charged to Output 1.3 – see Budget Note C, for administrative costs, and to BL57)*.
4. Execution of construction works *(to be charged to BL56 and BL59)*.
5. On-site technical assistance and supervision *(to be charged to BL55)*.
6. Setting up a mechanism for maintenance (see below on sustainability) *(to be charged to Output*

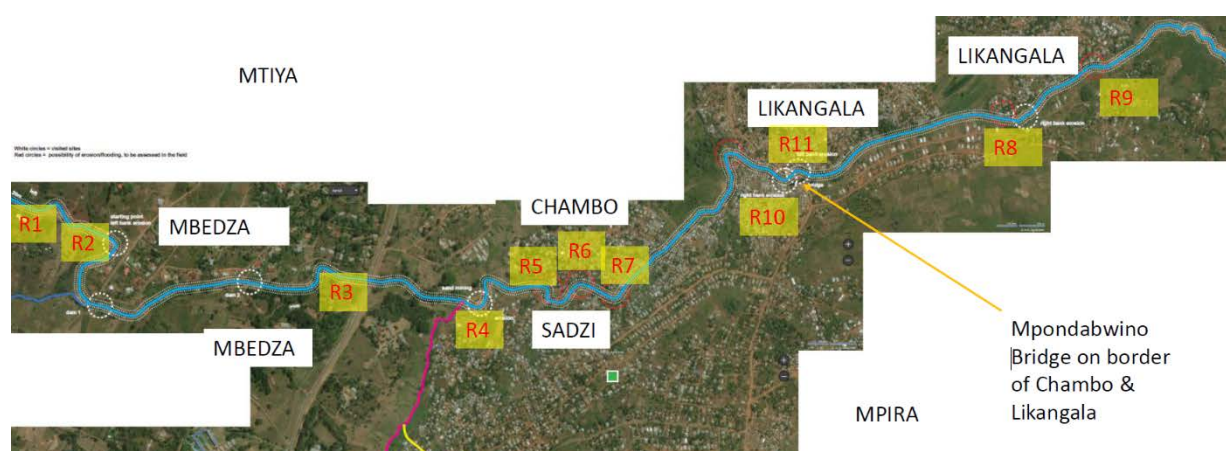


Figure 11: Proposed locations of gabion basket installation

1.3 – see Budget Note C).

## Social, economic and environmental benefits

Approximately 20,000 people will benefit from the following aspects:

- River accessibility to local residents and visitors will be enhanced. Overall, critical areas of the river banks will be stabilised, which will improve safety. Related to this, the river will not encroach on urban land as well as farming land when river levels are high, hence damage to assets and housing is prevented and urban agriculture and livelihoods are protected.
- Gabion baskets at points R10 and 11 (see map in figure 3) will also protect a bridge (Mpondabwino Bridge - see Sub-Project fiche 5.2.6) as critical infrastructure.
- In terms of immediate economic benefits, communities will be involved as paid labour in construction works and related maintenance and cleaning needs.
- Reduced bank erosion and subsequent sedimentation, and reduced flood risk.

## Sustainability

It has been observed that no organization at the local level is directly responsible for the river and its management (one would need to contact authorities at the national or sub-national levels). Hence an agreement will need to be put in place between the concerned riparian communities, the Zomba City Council and the responsible entity at national level to ensure maintenance of the intervention once the infrastructure is handed over.

Maintenance needs are as follows for gabion baskets:

- Gabion baskets may be susceptible to general wear and tear due to silt and debris contact via the river;
- The baskets need to be inspected for scour to ensure the structure is not undermined;



- The baskets may be liable to rust after lengthy exposure to the water; this can be mitigated by not using rust-prone material;
- Regular inspections are required to affirm the integrity and safety of the structure, and that flood protection is sustained; it is necessary to schedule these in to ensure maintenance costs remain low;
- Overall, yearly inspection and repair if needed is estimated at an approximate of 2 percent of the total investment.

A maintenance plan for dams depends on the detailed design of the refurbishment, which will include aspects of maintenance. Costs were estimated to be manageable by the city council.

Additional, by-laws to prevent informal sand mining in the targeted areas will have to be enforced in a stricter manner, including payment of penalties. This means that involving the riparian populations in this initiative will be crucial, through awareness-raising and surveillance/reporting mechanisms. Additionally, alternative livelihood options will have to be identified for the sand miners.

### Design details

The sub-project aims to install slope protection features along identified areas of the banks of the Likangala River (see map in figure 11). The areas that are most at risk are proposed for installing the gabion baskets, as they offer a number of benefits:

- Provides robust, long-term protection;
- Requires minimal maintenance;
- Presents less technical risk than other options (concrete walls, sheet piling, anchored matting);
- More cost effective than other possible solutions (concrete walls, sheet piling);
- There is a known supply of materials and plant in the vicinity;
- There are known contractors in the areas that are able to install gabion baskets;
- The solution is relatively more environmentally friendly;
- The solution is relatively less intrusive to local residents;
- They can be installed in situ, meaning their installation can be best adapted to the terrain.

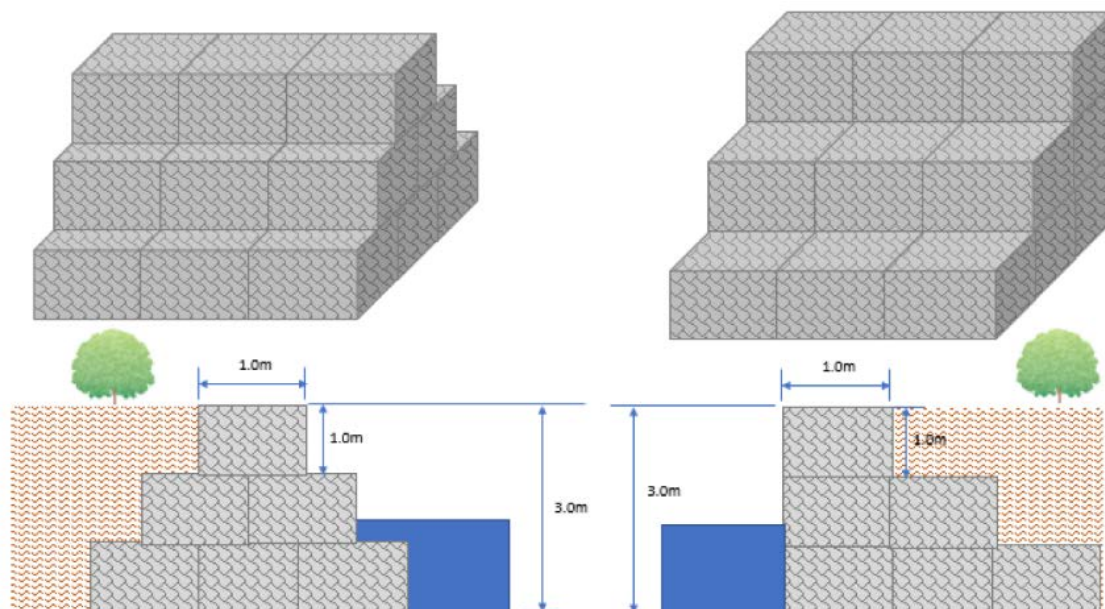


Figure 12: Conceptual design of gabion baskets to be applied in the Likangala River

## **SUB-PROJECT FICHE 5.2.6: Construction and rehabilitation of bridges and dams on Likangala River**

### Overview

The Likangala River is the main river running west to east across the City of Zomba dividing the city into two. Communication between the southern and northern parts of the city is through two main bridges: the Likangala Bridge on the main M3 Road which connects the city to other parts of the country, and the Mpondabwino Bridge. There are other informal bridges constructed by individuals or communities, notably the 'Two Million (Namalaka) Bridge'. These bridges are critical for ensuring proper circulation of

people and goods in the city, accessing social services and in times of disaster, to allow evacuation and provide access to the safe-havens to be built under Sub-Project 5.2.2.

In particular, the Two Million Bridge connects Sadzi and Chambo wards. It represents a very critical infrastructure for accessing the Zomba Central Hospital and the safe-havens planned in Sadzi and Chambo wards. The bridge is informal and non-engineered and poses a risk to the users. Among the proposed interventions under this sub-project it is proposed to demolish it and build a new one.

The Likangala Bridge is the main bridge of Zomba connecting the city to other parts of Malawi, and serves the whole city population. Meanwhile the Mpondabwino Bridge connects Likangala and Sadzi wards, which are the two most densely populated wards in the city. Both bridges have suffered from the scouring effects of the 2015 floods and are in need of rehabilitation to ensure that they are robust and safe to use.

The two dams on the Likangala in Mbedza were built in the 1950's and have acted as a flood control measure for a long time but the dam walls are now dilapidated and no longer functioning effectively.

### **Implementation strategy and planned activities**

The bridges/dams construction and rehabilitation works will be carried out by local contractor(s) following a competitive bidding process. The city council's Engineering Department supported by Roads Authority engineers will be responsible for the technical supervision of the project.

The contractor's labour force will be hired as much as possible among the local population, and will follow national labour laws which are based on ILO standards.

The overall planned activities for the drainage interventions are *(for the budget references, please see Annex 1)*:

1. Preparation of detailed engineering studies and designs, as well as bills of quantities *(to be charged to Output 1.1 – see Budget Note A and to BL60)*.
2. Selection and contracting of local contractor(s) *(administrative tasks to be charged to Output 1.3 – see Budget Note C)*.
3. Recruitment of local labour among the population *(administrative tasks to be charged to Output 1.3 – see Budget Note C)*.
4. Execution of the construction works *(to be charged to BL61, BL62, BL63 and BL64)*
5. Monitoring and supervision of construction works *(to be charged to BL60)*
6. Maintenance ensured by the city council *(technical expertise to support the process to be charged to Output 1.3 – see Budget Note C)*.

### **Social, economic and environmental benefits**

The community consultations in Sadzi ward revealed that at least one person has ever fallen into the river and died due to the unstable Two Million Bridge, which is dangerous to use especially during river flooding times. Currently school children using the bridge on a daily basis in both Sadzi and Chambo wards reported their fears when crossing it to reach either Bwaila School or Sadzi School. Women also expressed particular fears of the bridge to access the Central Hospital, especially in times of floods. The bridge therefore needs to be re-built in a safer and more robust manner so that it can better serve the purpose of protecting lives and accessing critical services during flood times, and improve the overall connectivity of the city, which is so critical for evacuation purposes.

Any impairment to the functionality of the Likangala Bridge would greatly hurt the city economy and in times of disasters make it harder for the city and its residents to recover.

The community consultations further revealed that sugarcane farming is important for the people of Sadzi and they rely on the Zomba Main Market, which is on the northern side of Likangala River to sell sugarcane and other products. The Mpondabwino Bridge is important not only for accessing the Main Market as well as the Mpondabwino Market, but also in times of flood emergency to evacuate and access the safe-haven to be built in Likangala ward, which will also serve the surrounding wards.

Finally, the two dams to be rehabilitated through this sub-project constitute important flood control measures.

### **Cost effectiveness**

Although the Likangala Bridge is an old structure, it is still robust. The Mpondabwino Bridge is a fairly new bridge and is also generally robust. It is cost-effective to rehabilitate these two bridges rather than building new ones, since the rehabilitation works give proper protection to them, preventing their



collapse in the long-term. The Two Million Bridge cannot be rehabilitated because it is not robust and not engineered, hence it needs to be re-built.

### Sustainability

The Zomba City Council is the roads and drainage authority within the city jurisdiction and will be responsible for maintaining the rehabilitated/re-built bridges using its regular budget, once they are handed over to the city. The budget required for maintaining the bridges is relatively low and can easily be covered by the annual maintenance budget of such structures by the city council. Further, local engineers will be involved in the rehabilitation and construction works and city council staff trained on maintenance issues.

The planned river-focused interventions in the Likangala River under Sub-Project Fiche 5.2.5 will also contribute to the sustainable protection of these bridges, as they will reduce river erosion through the installation of gabion baskets and reduce/eliminate activities related to informal/illegal sand mining.

Consultations with the city council showed that when rehabilitated the city council would like to use the rehabilitated dams for additional purposes, apart from their flood control function, including for recreational activities. This multi-functionality of the dams augurs well in terms of sustainability.

### Maps and design details

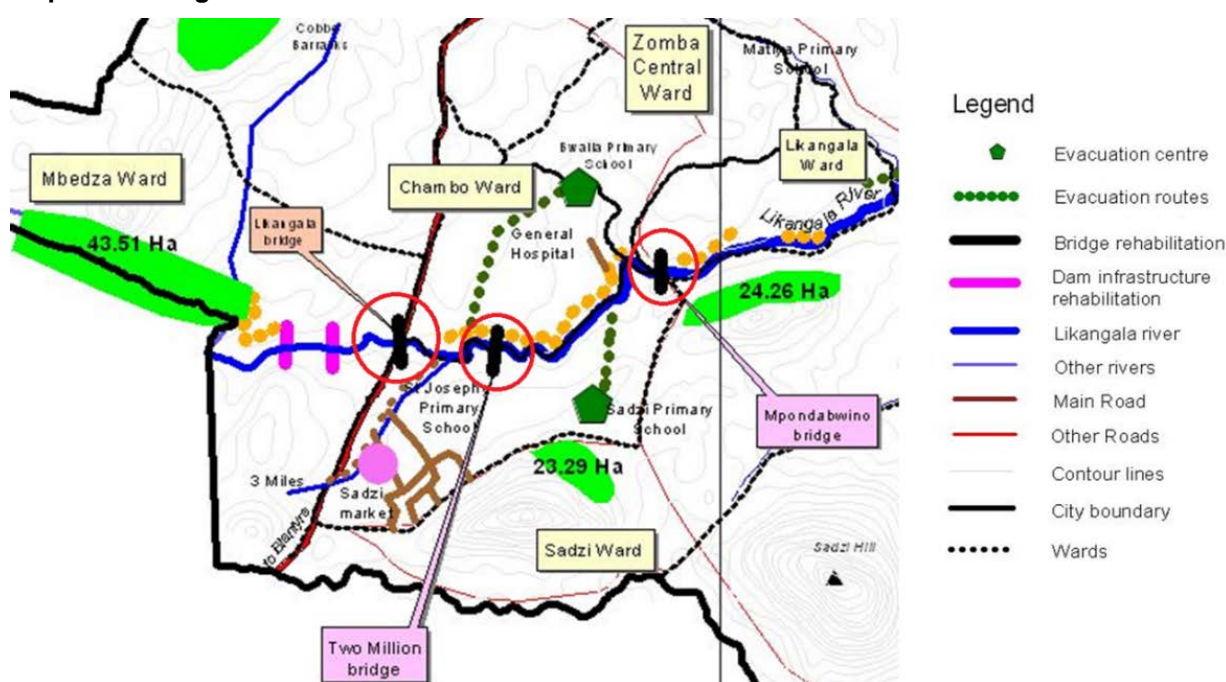


Figure 13: location of the three bridges (black lines) and the two dams (magenta lines) targeted by the sub-project

For the rehabilitation of the two bridges, Mpondabwino and Likangala, preparatory works will involve the detailed bills of quantities and, related to this, exact measurements of elevations around the bridge pillars to estimate the depth of erosion occurred. Firstly, in order to maintain the pillar construction of the bridge it is proposed to bring waste stone around the pillars. At least a layer of 0.5 m thick stones sorting 10-60 kg. Secondly, it is proposed to build a longitudinal groyne to better direct the water flow under the bridge. These longitudinal protection structures are hydraulic structures with their length parallel to the river flow. The purpose of these is to support the existing natural river bank, serve as erosion control, control of meandering, containment of the normal flow channel and last but not least flood protection. With a view to the strong meandering of the river at the bridge, a longitudinal dam or groyne or sheet piling is suggested.

Regarding the two existing dams to be rehabilitated upstream the Likangala River, they were originally instated to provide irrigation to surrounding areas. However, they are no longer functioning as initially intended and have been impacted by wear and weather events. The 2015 flood event and everyday river action has resulted in erosion and siltation at the dams and their surroundings. The rehabilitated dams will play an important role in terms of flood control, by reducing the speed of the water flow, and to facilitate irrigation during the dry season.

## SUB-PROJECT FICHE 5.2.7: Sustainable urban forest management

### Overview

Hillside areas play an important role in provoking flooding and undirected water flows affecting Zomba city. Further, tree cutting on hillside slopes and on the river banks at the valley bottom cause erosion through accelerated runoff of rainwater and floodwaters respectively. This sub-project involves tree planting on hillsides and river banks in seven wards of the city with a view to prevent soil degradation, erosion, gully progression/enlargement, landslides and rock avalanches, which can also reduce the overall flood intensity. At the same time, tree nurseries will be established in each ward to facilitate the afforestation measures.

### Implementation strategy and planned activities

The implementation of this sub-project involves close cooperation with the Forest Research Institute of Malawi (FRIM) based in Zomba, as well as the Zomba District Forest Office responsible for urban forestry. Two main interventions are planned: setting up of tree nurseries and tree planting, as well as important support interventions to enhance the overall sustainability of the initiative. For managing the afforestation process and the tree nurseries, local committees at ward level will be established and mobilised, taking advantage of the existing natural resources management committees.

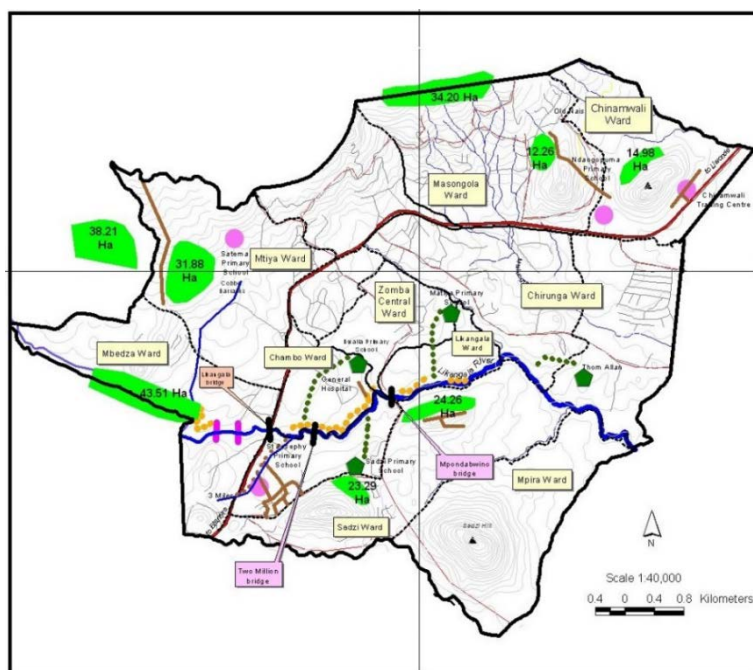


Figure 14: map showing the location of the areas to be afforested (green areas)

The tree nurseries will be set up in all target wards to ensure the provision of seedlings for carrying out the afforestation activities. The management and maintenance of the tree nurseries will be under the responsibility of the above-mentioned community committees, with the important guidance from both the FRIM and the District Forest Office. The latter will provide assistance for the design and set up of the tree nurseries, as well as the technical specifications for selecting the appropriate tree species to be planted. With regard to the latter, in addition to their function of retaining runoff/rain water, wind resistant trees species can provide protection against heavy rainstorms, whilst fruit and/or nut trees have socio-

economic benefits.

According to calculations made by the FRIM, between 1,000 and 1,600 seedlings are required per hectare to ensure optimal afforestation standards. The seedlings will be made available through the FRIM. These need to be nursed for 1-2 years (depending on the species) before they can be planted. After planting, the trees need to be taking care of for the first years, e.g. spud out weeds.

The following main activities are planned (*for the budget references, please see Annex 1*):

1. Selecting exact locations for establishing the community-based tree nurseries to plant and nurse seedlings; the sub-project expects to establish two (2) tree nurseries for each target ward, for a total of 14 tree nurseries (*to be charged to BL66*).
2. Design of tree nurseries, including selection of species as fruit trees (e.g. mango and tangerine) or nut trees (Cashew and Macadamia) where possible, Brastigia and Bamboo, and setting up of management and maintenance mechanisms with the community committees, through proper training and supervision (*to be charged to BL65 and BL68*).
3. Delimitation, assessment and preparation of land for afforestation, including the preparation of an environmental and social management plan. Between 1,000-1,600 seedlings per ha will be planted (in total 290,000 seedlings to cover an area of approximately 225 hectares) (*to be charged to Output 1.1 – see Budget Note A and to BL65 and BL67*).
4. Planting of trees through community involvement (*to be charged to BL67*).

5. Training of community groups to manage nurseries and planting
6. Monitoring and maintenance of planted trees, through the establishment of proper surveillance and penalty (through a fine) system, as a control measure against tree cutting) *(to be charged to Output 1.3 – see Budget Note C and to BL65).*

### **Social, economic and environmental benefits**

- Approximately 77,789 people will directly benefit from the role the afforested areas will play in terms of avoiding soil erosion, land degradation, rock avalanches, flash floods and landslides;
- The entire population of the city (156,022 people) will indirectly benefit from the ecological value derived from the rehabilitated ecosystems;
- Communities, especially women, will be involved in tree nurseries and tree planting; they will learn new skills and earn an income; communities will benefit from new sources of livelihoods that are more sustainable than illegal deforestation; the planting of nuts and fruit trees will also generate further income to households;
- Women and men will be trained on building energy efficient cooking stoves as well as briquette burning; such small business opportunities can generate a regular income; improved cook stoves would also generate significant costs savings to the families;
- Energy efficient cooking stoves generate less smoke and are hence less detrimental to the health of women compared to cooking with firewood;
- Environmentally, tree planting will enhance absorption of carbon dioxide, stabilise the soils, minimise erosion and reduce land degradation.

### **Sustainability**

Considering that the need for firewood is the main reason for the deforestation due to heavy dependence on biomass (80% firewood; 10% charcoal), the main concern of this intervention will be to ensure that the local population has access to alternative sources of livelihood (i.e. away from selling firewood as means of income) and uses less firewood overall. Alternative livelihood options will be fostered such as bee keeping and trainings for the construction of energy efficient cook stoves as well as briquette making. Women will be specifically targeted for training and support the adoption of more sustainable livelihood options at the household level.

At the same time, fruits and nuts will be produced by the tree nurseries and provide an alternative income. The sub-project will employ community members for tree planting in all the target areas. Once the trees start producing fruits and nuts, the community members will have an incentive to continue/sustain the tree planting where needed. Bee-keeping activities will also be promoted through this sub-project.

Based on lessons learnt from recent initiatives (best practice cases in Sadzi and Mpira ward where similar forest management approaches were successfully carried out), community by-laws will be introduced to protect the realised afforestation activities. This will include a control and penalty system, to prevent tree cutting activities.

In sum, the following activities will be conducted to support preservation of the afforested areas:

- Raise awareness regarding the relation between tree cutting, erosion and flooding;
- Promote alternative livelihoods and tree-based enterprises such as fruit and nut trees as well as bee-keeping;
- Promote energy efficient resource use for cooking (i.e. energy efficient cook stoves) and briquette burning to reduce the need for wood;
- Facilitate community level by-laws regarding forest management, including control/punishment mechanisms.

### **Design details**

The main purpose of the support interventions is to reduce the use of charcoal and increase the awareness and uptake of alternative cooking fuels by introducing briquettes and energy efficient cook stoves.

#### **i) Briquettes**

Briquettes are made with a mix of tree leaves, sawdust, waste paper and charcoal dust in different proportions. The briquettes are made using a locally-made, manual low-cost press that does not depend on electricity and are then burned in locally-made and energy efficient briquette stoves.

LEAD International disposes of such a briquette making machine and will offer it to the project free of charge for training and piloting purposes.

**ii) Energy efficient cook stoves**

As lesson learnt from DFID's Enhancing Communities' Resilience Programme (2011-2017) (see Part II, section G), it was reported that fixed stoves are preferred to portable ones by communities as they are made from cheap and locally available materials. On the other hand, portable stoves were of advantage as one can use them anywhere.

Factors influencing uptake of cook stoves will be analysed so that proper strategies can be set up for promoting and disseminating more energy-efficient (and cheaper) cooking techniques. With the alarming deforestation rates currently prevailing in Zomba, cook stoves of any type should continuously be promoted. Consequently, the sub-project will carry out a market/consumer analysis prior to choosing the specific kind of cook stove that will be used.

## 5.3. CITY: CHOKWE, MOZAMBIQUE

### SUB-PROJECT FICHE 5.3.1: Improving the overall drainage capacity of the city

#### Overview

This sub-project's intention is to undertake different drainage rehabilitation/construction interventions in specific locations, which after due analysis are considered critical to improve the overall efficiency of the drainage system of the city. These will be a kind of acupunctural interventions to ensure the continuity of the water flow in the drainage system, so that excess water (originated from rainfall or river flood) can be evacuated. The determination of these critically important locations results from several field surveys, cartographic analysis and consultations with municipal engineers and with local inhabitants.

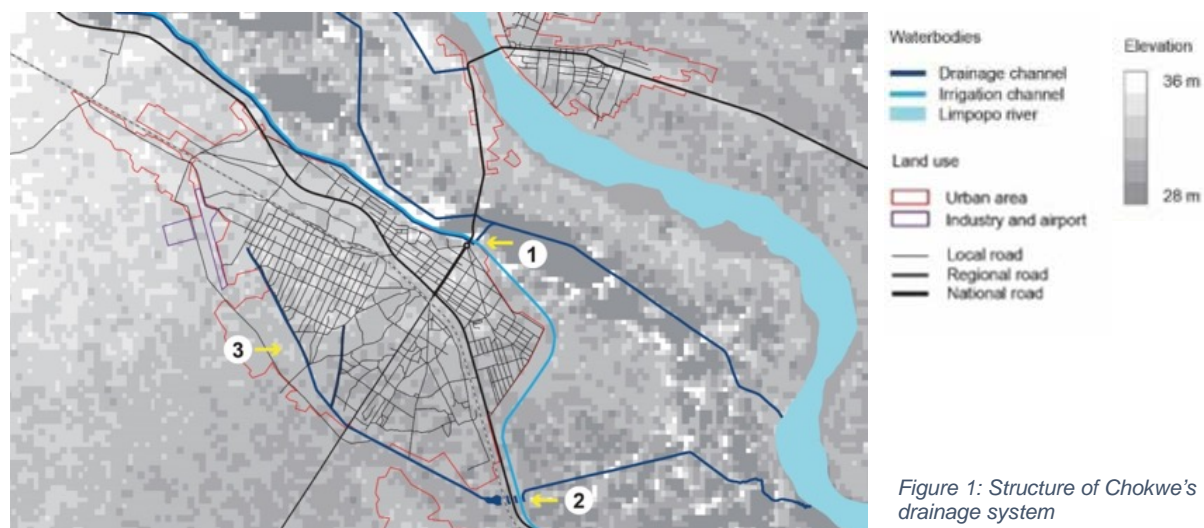


Figure 1: Structure of Chokwe's drainage system

#### Implementation strategy and planned activities

The overall planned activities for the drainage interventions are *(for the budget references, please see Annex 1)*:

- 1) Preparation of detailed studies, including technical specifications, bill of quantities and detailed designs *(to be charged to Output 1.1 – see Budget Note A and to BL69)*.
- 2) Simplified Environmental Study (SES), including an Environmental Management Plan (EMP) according to the national legislation (see Part II, Section F, on national technical standards) *(to be charged to Output 1.1 – see Budget Note A)*.
- 3) Tender for selecting and contracting the local sub-contractor *(administrative tasks to be charged to Output 1.3 – see Budget Note C)*.
- 4) Community mobilisation and information process *(to be charged to Output 1.3 – see Budget Note C)*.
- 5) Recruitment of labour among the local population *(administrative tasks to be charged to Output 1.3 – see Budget Note C)*.
- 6) Execution of the construction works *(to be charged to BL70)*.
- 7) Monitoring and establishment of sustainable drainage maintenance mechanisms *(to be charged to Output 1.3 – see Budget Note C)*.

#### Social, economic and environmental benefits

- Approximately 45,800 people (9,000 households) will benefit directly from the construction/rehabilitation of drainage channels in neighbourhoods 3B, 4 and 5 in terms of flood risk reduction and better sanitary and environmental conditions, and indirectly the whole city (68,000 people) since these interventions will improve the overall drainage efficiency;
- Reduction of water-borne diseases (e.g. malaria, diarrhoea, etc.) from stagnant waters;
- More investments will occur in the city as a result of better drainage and environmental conditions.

#### Sustainability

To ensure constant maintenance of the newly built or rehabilitated drainage channels, trained community groups will be involved from the beginning of the sub-project. These will be the same groups



that carry out solid waste management activities (see Sub-Project Fiche 5.3.3). A written agreement will be established between these groups, the city council and ARA-SUL<sup>1</sup> in support to the proper management and maintenance of the drainage channels. Necessary equipment will be purchased for this purpose, and appropriate rules and procedures will be established. The agreement will be based on the general principle that these community groups are paid for their services, while the authorities oversee the quality, effectiveness and regularity of the maintenance operations. The city council will start to budget drainage maintenance costs one year after the beginning of the sub-project.

## Maps, photos and design details

### i. Construction of three sets of drainage pipes and valves with high capacity

As a consequence of the 2013 floods, the pipes have collapsed and the inlets are silted up. There was no repair done since then. As a result, the main drainage channel to the south (indicated as number “3” in figure 1) cannot properly drain the collected storm water, leading to prolonged flooding events. Bringing back the discharge capacity to its former functioning will serve two main purposes. River floodwaters can be discharged through the southern drainage channel, potentially reducing flood duration in neighbourhoods 3A, 4 and 5 from more than 14 days to about 7 days, depending on the specific flooding scenario and flood progression. In addition, flash floods (caused by rainfall) will recede more quickly as the full discharge capacity of the southern drainage channel can be utilised.

Therefore, this intervention aims to re-build the drainage pipes on the underground crossing “2” (see figure 1) which is currently non-operational to reconnect the southern drainage channel to the channel leading to the Limpopo River. Moreover, other important interventions such as the extension (explained in section ii. below) and rehabilitation (explained in section iii. below) of the existing main drainage channel will only have an effect when this reconnection of channels will be done.

The construction and inlets will be designed to resist to flooding impact by using hard structures to limit erosion and siltation in and around the inlets and the inlet retention area. A conceptual design for the interventions needed near the inlet port is shown in figure 2.

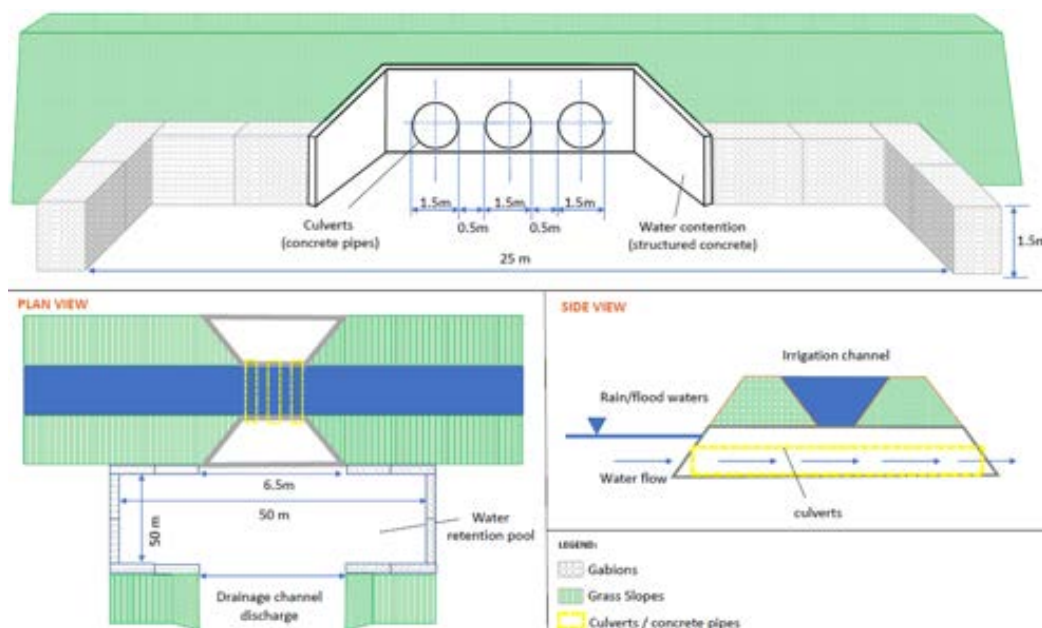


Figure 2: Conceptual design of set of drainage pipes and valves with high capacity

### ii. Rehabilitation of the southern drainage channel

The southern main drainage channel has broken its banks near bottlenecks in its course. The situation is worst in the most southern section, where the obstruction and collapse of the discharge pipes led to drainage congestion. Additionally, a small bridge in neighbourhood 5 (see figure 5) is clearly obstructing the discharge of drainage waters and creates a bottleneck which leads to local flooding of the area, including a local road. The channel's banks have eroded (Figure 6) over its complete length, leading to siltation and loss of discharge and retention capacity downstream.

<sup>1</sup> ARA-SUL is the agency responsible for managing the river basins in southern Mozambique, including the Limpopo River which flows near Chokwe. It is involved in the hydrological modelling including water availability, dam operation and flood forecasting.



Figure 3: Southern drainage channel (1: location of bridge obstructing the channel; 2: regional highway bridge, which is not an obstruction; 3: T-joint in the drainage channel).

Removing the bottlenecks, replacing obstructing structures, and rehabilitation of the channels banks and course way will improve the discharge and retention capacity and will limit flooding from both pluvial and fluvial sources. Moreover, the proposed extension of the drainage channel (intervention iii. described below) requires the main drainage channel to operate at its designed capacity.

### iii. Construction of new drainage channels in neighbourhoods 4 and 5

Here it is proposed to build new drainage channels as an extension of the southern main drainage channel in neighbourhoods 4 and 5, which are the most vulnerable areas

of the city and house the poorest population. Both drainage channels run through medium density neighbourhoods. To limit the risk of property rights issues, both drainage channels will be built along existing public roads (see figure 3).

### iv. Maintenance of the northern drainage channel

Part of the northern drainage channel has collapsed after the 2013 floods and has been grown over with vegetation for a length of 1.3 km. Rehabilitation of the channel will drastically improve the drainage conditions of neighbourhood 3B. The maintenance will involve two steps:

- First, carry out a site cleaning, including the removal of vegetation and solid waste;
- Second, remove the top soil along the drainage channel for a depth of 0.30 metres.



Figure 4: Conceptual design of new drainage channel in neighbourhood 4 (right) and 5 (left)

## SUB-PROJECT FICHE 5.3.2: Construction of safe-havens

### Overview

The City of Chokwe has suffered cyclically from floods that are characterised by the destruction of infrastructure and sometimes loss of human lives. During these events, one of the most critical aspects is the existence of a safe place where communities can take refuge and save some assets that are fundamental for their post-disaster recovery. During the local consultations, community members, especially women and the most vulnerable (see **Annex 2** for data and information on marginalized and vulnerable group in Chokwe), expressed the need for evacuation centres (or safe-havens) in their neighbourhood that can be accessed during a flood emergency. Current evacuation centres are located too far from the city.

In this context, the construction of safe-havens in critical areas of the city will greatly contribute to vulnerability reduction of the most vulnerable community members. These elevated constructions will



have a double function: they will serve as shelter during flood emergency times, and as school classrooms and community centres (to organise social events, trainings, workshops and meetings) in normal times. These multi-purpose safe-havens will be built in already identified primary schools' plots and will be managed by the schools' officials. They will be designed as elevated platforms using construction techniques that make them resistant to floods and strong winds, with the possibility to harvest rainwater. UN-Habitat has a long experience of this type of constructions in disaster-prone areas in Mozambique, also influencing the school building codes at the national level. This UN Agency has successfully built an elevated school that serves as safe-haven in case of an emergency after the 2013 floods in neighbourhood n. 5 (see map in figure n. 1).

### Implementation strategy and planned activities

For implementing this sub-project, first of all, detailed designs will be developed including all technical specifications and bill of quantities, according to the local and topographic/ environmental conditions of the construction sites. The climate proofing design of the safe-havens (from both an architectural and engineering perspective) is

very important and adequate expertise will be mobilised for such a purpose (to be charged to Output 1.1 – see Budget Note A and to BL71 in Expected Output 1.2 in Annex 1).

A local contractor will be hired to build two (2) new safe-havens (see their location in figure 1 – they are marked as “planned”) through a tendering process to be organised by the city project office, which will provide technical support and supervision during the construction phase (to be charged to



Figure 5: Location of the 3 safe-havens in Chokwe, one already completed and two to be built; an evacuation route links the 3 structures

Output 1.3 – see Budget Note C in Annex 1). The local contractor will be required to hire man power as much as possible among the local communities, favouring women.

The involvement of the local community (especially women, older persons and persons with disabilities) during the design and implementation phases will be ensured, so that they can support the process. Local master builders will also learn about some of the construction techniques to be applied for climate-resilient construction, which they can then replicate when building/improving houses, for example. For this purpose, local trainings/workshops will be organised for presenting the architectural and engineering designs/solutions to be applied in the safe-haven, especially targeting local master builders (to be charged to Output 1.3 – see Budget Note C in Annex 1. Construction costs for both safe haven will be charged to BL72 - see Expected Output 1.2).

### Social, economic and environmental benefits

- Approximately 8,300 families living in neighbourhoods 3A, 3B, 5 and 7 will benefit from the safe-havens in case of floods, especially women, marginalized and vulnerable groups;
- Around 24,900 school pupils from different neighbourhoods from the city (mostly from where will be located the safe havens) will benefit from new classrooms;
- The operation of safe-havens will prevent loss of properties and human lives during the flood season in the city and will contribute to reduction water-related diseases like malaria, etc.;
- The local communities will benefit from a well-equipped space where they can meet, socialise and be trained in normal times.

### Sustainability

The safe-havens will be built in existing schools' plots. The management and maintenance of such infrastructure will be supported by the school's administration, under conditions to be agreed with the



municipal council and the concerned communities. Moreover, training and awareness raising sessions will be delivered to communities for the proper use of the safe-havens.

### Design details

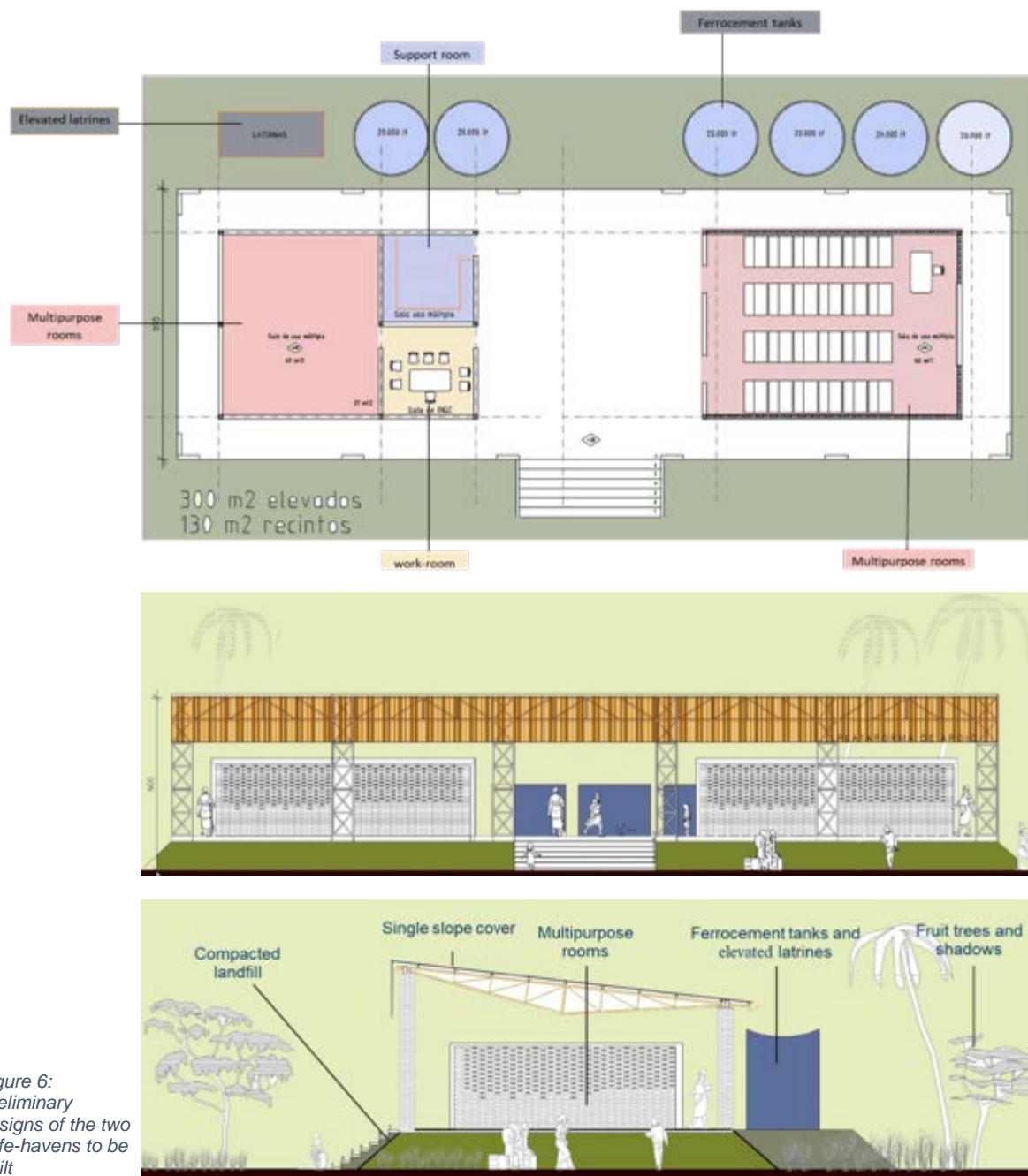


Figure 6:  
Preliminary  
designs of the two  
safe-havens to be  
built

### **SUB-PROJECT FICHE 5.3.3: Improving solid waste management**

#### **Overview**

In Chokwe Municipality, no formal landfill site exists in Chokwe. At present solid waste is currently dumped in an informal site located in neighbourhood n. 4, which is 2 km from the city centre. The dumpsite is not fenced and there is no proper waste management taking place there. Both animals and humans have free access to the site, with subsequent challenges in terms of public health. A study carried out in 2009 recommended the construction of a sanitary landfill as a matter of urgency; however, since then it did not happen yet and the situation is deteriorating.

According to the above mentioned 2009 study carried out by WAPCOM (2009) only 27% of households benefit from formal waste collection services. The rest of the residents dig a rubbish pit (35%), burn

their waste (12%) or simply dump it informally (27%). In 2012, a solid waste management strategy for Chokwe (2010-2025) was developed. This sub-project is aligning to the proposed priorities in this document, among others: (i) design and construction of a landfill site; (ii) purchase of equipment; and (iii) training of staff.



Figure 7: Map locating the proposed SWM interventions: Neighbourhood Recycling Stations (orange diamonds) and Mini Waste Collection Points (yellow diamonds)

### Implementation strategy and planned activities

For this sub-project, the following activities are proposed (for the budget references, see **Annex 1**):

1. *Establishment of a community-based integrated Solid Waste Management System (SWMS) in 3 neighbourhoods (3, 4 and 5):* the community-based integrated SWMS will be established and operationalised in these neighbourhoods where drainage interventions are planned to be carried out (see Sub-Project Fiche 5.3.1) to ensure that waste is removed, especially in areas poorly served by the municipality, and does not hamper the efficiency of the storm water drainage system. Importantly, recycling has not been yet introduced in Chokwe and communities are not familiar in sorting the waste. Meanwhile recycling is an effective measure for mitigating the effects of climate change as it helps reducing green-house gas emissions in the air, and can generate income at the community level, especially for women. The establishment of the SWMS will result from a formal partnership agreement between the municipality (through its Sanitation and Environmental Department) and the targeted communities, with clear roles and responsibilities, to enhance waste collection at the neighbourhood level and to monitor/maintain the drainage system so that it remains clean and functional, thus reducing the risk of local flooding in case of heavy rains. The community groups responsible for operationalizing the SWMS will be composed for at least 50% by women. Waste will be collected regularly from the households in the 4 neighbourhoods and transported to specific and accessible waste collection points, which will then be collected by the municipal truck. The community groups will be properly equipped and trained for both collecting/treating the waste and for raising awareness on appropriate waste management practices and on the relationship between stagnant water/dirty drainage and health implications. *(to be charged to Output 1.3 – see Budget Note C and to BL73 and BL76).*
2. *Construction of 3 waste collection and treatment centres, one per targeted neighbourhood:* through joint consultations between the municipality and the community representatives, suitable areas within the 3 targeted neighbourhoods were identified for the construction of the community-based waste collection and treatment centres. The sites were selected based on the following criteria: (i) accessibility to municipal trucks for waste collection; (ii) safety and security, to avoid worsening the sanitary and hygienic conditions of the neighbouring environment; (iii) space availability for future expansion. An in-depth impact assessment study will be necessary to ensure that the location of waste collection and treatment centres is suitable. basic layout of the centres is provided in figure 8; they will include at least: (a) fenced area; (b) closed building structure; (c) external paved area for storing the waste; and (d) toilet facilities *(to be charged to BL74).*
3. *Purchasing of the waste management equipment:* the following equipment will be bought: waste bins, waste collection tools (trolleys, etc.) and other equipment (plastic bags, gloves etc.). The community groups will receive technical training on how to use and maintain the equipment *(to be charged to BL75).*
4. *Provision of technical assistance to the city council on waste management and climate change mitigation:* this technical assistance will focus on awareness-raising (nexus between climate

change and waste management) and on developing methodological skills for waste management (collection and recycling) at city and community levels (*to be charged to BL74*).

5. *Awareness-raising activities at community level:* positive behaviour of the communities in appropriate waste management practices is a key factor for the success of the sub-project. Awareness-raising will include door-to-door activities, training/debates/ drama sessions in schools, etc. (*to be charged to BL76*).

### **Social, economic and environmental benefits**

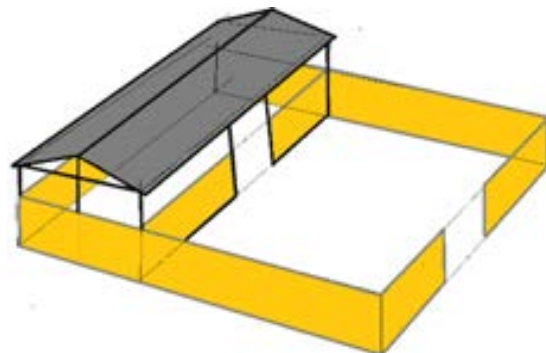
- Environmental: the city of the Chokwe will benefit from: (i) a decrease of garbage that is left on the street or in vulnerable areas and a reduction in air and soil pollution as a consequence of improved waste collection; (ii) a cleaner city resulting from better understanding by the communities and the city council on the importance of adopting sustainable waste management practices; (iii) reduced risk of localised floods.
- Social: approximately 35,000 people (total population of the 3 targeted neighbourhoods) will benefit from: (i) reduced exposure to environmental and health risks, thanks to a cleaner city; (ii) improved social cohesion resulting from the establishment of community groups responsible for waste management.
- Economic: the population of the 4 targeted neighbourhoods will benefit from: (i) increased economic opportunities from waste collection/treatment activities; (ii) reduced flooding risks for small-informal business (usually managed by women); (iii) increased cost-effectiveness for the city regarding waste management thanks to the establishment of the community-based integrated SWMS.

### **Sustainability**

- The inclusion of the costs related to the services delivered by the community groups operationalising the SWMS into the municipal budget will ensure sustainability of the sub-project; a waste collection tax (although symbolic) will have to be established for those households benefiting from the waste collection services.
- The formal partnership between the city council and the community groups helps building trust among these parties and will constitute the basis for the sustainability of the initiative beyond the project duration.
- Training and capacity building activities will empower people, especially women, and provide the necessary skills, knowledge and awareness to increase ownership by the communities and ensure the continuity of the SWM services.
- To ensure sustainability of this intervention, a multi-sectorial/institutional committee will be established comprised by the Municipality of Chokwe (responsible for managing this initiative), HICEP (responsible for maintaining the SWM equipment in proper conditions and to support the community groups), ARA-Sul (responsible for ensuring the efficiency of the drainage system) and the community groups themselves.
- SWM in Chokwe will constitute an integral part of the overall drainage maintenance plan. The referred community groups will be composed of 20-25 people (mainly women and young people) who will be responsible for both solid waste management and drainage maintenance.

### **Design details**

The area is paved with self-blocking cement bricks to guarantee the permeability of the ground and the transit of trolleys or other wheeled tools. Plot size will be 20 x 30 m, including a building structure of 10 x 20 m with a steel supporting structure, pitched roof with sandwich panels in sheet metal and rock wool (max. height: 5 m), and wall plugging at least 3 m high. The same curtain wall could continue outside, acting as a fence. Entrance door in steel on tracks, at least 3.5 m in width and 3.00 m in height. Toilet inside the building with the masonry at the same height as the curtain wall.



*Figure 8: Typical architectural design of a community-based waste collection and treatment centre*



### **SUB-PROJECT FICHE 5.3.4: Enhancing early warning for floods at community level**

#### **Overview**

The establishment of an effective early warning system (EWS) for floods in the case of Chokwe is absolutely essential. This is connected to the proper signalling of evacuation routes that can provide access to the safe-havens (see Sub-Project Fiche 5.3.2).

An operational EWS for the Limpopo River basin exists, and Chokwe is part of it. ARA-Sul is the institution responsible for the managing the EWS in the Mozambican part of this international river basin. It is structured around a transboundary network of operators and river management authorities that are tasked to monitor and report on the rising levels of the river waters. Chokwe can receive an advance notice of approximately 48 hours prior the flood wave.

However, past experiences (2000 and 2013 floods) have shown that although alerted, the local populations have delayed evacuation. This is due to a mix of factors, among others:

- the lack of awareness of the size of the river basin system they are part of; the Limpopo is a large river basin and floods downstream can be provoked by heavy rains upstream, while the weather in Chokwe is relatively good (i.e. not much rain);
- the reluctance of the households (especially the poor) to leave their house and their belonging unprotected in case of an evacuation;
- the lack of trust or the poor understanding of the alert message delivered by the responsible institutions;
- the lack of alternatives (higher and safer grounds may be far away) or communication means; etc.

Therefore, there is an urgent need to create a better level of understanding regarding the river's behaviour and to involve the local population in a deeper manner to ensure a more effective EWS locally. UN-Habitat after the 2013 floods has supported the city council in building an elevated radio station, as assessments have shown that half of the population listen to the radio from which an early warning message can be sent. However, this is not sufficient and considering the growing size of the city more reliable communication means need to be established, such as the installation of an automated system with sirens signalling to the population the need to evacuate.



Figure 9: Evacuation route linking the 3 safe-havens to be built/used under Sub-Project 5.3.2

Overall, experience has demonstrated that preparedness measures and clear and rapid evacuation procedures are not yet in place in Chokwe. The poor and the most vulnerable are the ones suffering the most from this situation, which is aggravated by flash floods provoked by intense rain events during the raining season. These events often remain under-reported and are not yet adequately monitored.

This said, any communication system will remain ineffective if it is not properly understood by the intended audience. Therefore, the education of Chokwe citizens regarding EWS is paramount, so that they can quickly be aware of the type of natural phenomenon that is unfolding, its severity, and what needs to be done to ensure their safety. There is still a weak awareness of the link between early-action and avoidance of the worst consequences triggered by the floods. This is because communities are not consistently integrated into early warning mechanisms.

For a city as vulnerable as Chokwe there is a need to promote the culture of “living with floods”, which involves better preparedness and response (e.g. EWS, emergency drills, etc.), improved coordination and communication among the different stakeholders, adequate contingency planning, and most

importantly working on prevention: more resistant and better adapted housing, safe-havens, flood-proof public infrastructure and social/basic services, etc.

### **Implementation strategy and planned activities**

For this sub-project, the following activities are proposed (*for the budget references, see Annex 1*):

1. *Mark identified evacuation routes to facilitate access to safe-havens:* evacuation routes have been identified and mapped out during the consultations with local communities. They now need to be properly marked and signalled so that they become visible and can be easily identified and used during a flood emergency. This activity needs to be led by the communities themselves in coordination with the responsible authorities, to increase the level of awareness and understanding (*to be charged to BL77 and BL78*).
2. *Establishing improved local communication mechanisms as part of the EWS in Chokwe:* community-based EWS need to be established to ensure that early warning messages are effectively communicated and understood by the local population, triggering a series of actions aiming at increasing the level of safety levels in case of floods. This means that enhanced communication mechanisms need to be established between the local communities and the responsible institutions at the different levels: municipal (city council), district and regional (ARA-Sul). The community radio already installed in neighbourhood 4 needs to be part of the EWS, and translate alert messages in local languages so that they can be better understood by the population. For this purpose, the radio station needs to be better equipped. Radio messages can be reinforced by a system of automated sirens, as well as through the use of megaphones by responsible/trained members of the local community. Importantly, marginalized and vulnerable groups need to be targeted so that early warning messages can reach them soon and they can be safely evacuated before the occurrence of an imminent flood (*to be charged to BL77 and BL79*).
3. *Awareness-raising and capacity building at the community level:* communities must be aware of the warning messages and know how to react to them. Training and awareness-raising activities will be delivered at the community level regarding disaster risk prevention, preparedness and response. They will include the use of different audio-visual materials, posters, booklets, games, cartoons, theatre representations, etc., as well as simulations or emergency drills to be coordinated with the responsible authorities (*to be charged to BL77, BL80 and BL81*).

### **Social, economic and environmental benefits**

- The development and effectiveness of an EWS will enable communities to have timely access to risk information and being prepare to avoid or minimise the worst consequence of the floods. It will also promote community mutual support and assistance, and improve access to the established safe-havens and basic services.
- The functioning of the EWS and safe-havens will allow people to saving/protecting their goods/assets before the occurrence of the disaster, and facilitate a quicker recovery.

### **Sustainability**

- Educational material on disaster risk reduction will be developed and distributed to the communities to promote a better understanding at the local level of preparedness and response mechanisms;
- Community members will be directly involved in EWS activities, including processes such as receiving flood information, analysing it and re-transmitting it to a larger public, to demystify the complex and technical language often used by formal media and authorities;
- Coordination will be established between Chokwe municipal council and concerned national and sub-national institutions in support to the implementation of this sub-project.

## 5.4. CITY: MORONI, UNION OF COMOROS

### SUB-PROJECT FICHE 5.4.1: Reinforcing the drainage capacity in La Coulée neighbourhood

#### Overview

The objective of this sub-project is to reduce the impact of flash floods in La Coulée neighbourhood through the construction of a main drainage channel. The channel will direct the flow of water from upstream to channels at the surface or underground pipes towards the main road and from there follow a path into the sea for nearly 2 km (see figure 1).



Figure 1: proposed drainage channels for La Coulée neighbourhood

La Coulée is a mostly informal and unplanned neighbourhood that has developed on top of an ancient lava flow, showing high slope steepness. Water from a large catchment above Moroni (see figure 2) is released in this area, which is densely populated with new buildings constantly under construction and poor urban dwellers. During the rainy season and especially during cyclones,

a large volume of water is generated provoking flash floods. Currently, since there is no drainage system in place, the runoff waters are scattered, provoking damage to both private property and public assets. In particular, a health clinic, a mosque and a Red Cross warehouse are at flood risk. Going down to the adjacent Phillips area, the flash floods heavily impact on the main hospital and a market. During extreme events, the water depth upstream is approximately 0.8 m and downstream 0.5 m. These depths occur normally from 2 to 4 times per year.

Apart from the absence of drainage systems in La Coulée area, the water runoff situation has been aggravated by the ash deposits from the Karthala 2005 eruption and the deforestation taking place upstream.

After receiving more daily rainfall data from the meteorological services on 9 May 2018 (i.e. from 1990 to 2000; NB: in previous calculations only rainfall data from 2010 to 2016 were used), and considering the need to build/dig a detention pond in the “Dog” location (see Figure 2) to reduce the speed of the water flow and convey it properly to the drainage system to be built in order to avoid overflow of water in case of heavy rainfall events, the overall cost of the intervention has increased. In fact, the detention pond will have a storage volume of 10,509 m<sup>3</sup> and the drainage channel section has increased.

The modelled scenario used the proposed pond and a conveyance system (routing runoff from the pond and adjacent overland areas to the ocean) which consist of a network of concrete ditches that would be placed in the road and a small segment of underground pipe required to connect an existing open ditch to the concrete ditches. Here are the results of the modelling for the two periods of rainfall data available:

#### Model Summary from 1990 to 2000:

- Peak inflow from DA 1 to Dog Pond (see locations in Figure 2): 292.58 m<sup>3</sup>/s
- Total number of hours modelled (Jan 1, 1990 to June 30, 2000): 91,992 hours
- Total number of hours Dog Pond storage capacity is exceeded: 30,812 hours
- Percentage of time that Dog Pond will flood: ~ 34%
- Percentage of time that Dog Pond will not flood: ~ 66%

#### Model summary from 2010 to 2016:

- Peak inflow from DA 1 to Dog Pond: 67.05 m<sup>3</sup>/s
- Total number of hours modelled (Jan 1, 2010 to December 31, 2016): 61,344 hours
- Total number of hours Dog Pond storage capacity is exceeded: 10,390 hours



- Percentage of time that the Dog Pond will flood: ~ 17%
- Percentage of time that the Dog Pond will not flood: ~ 83%

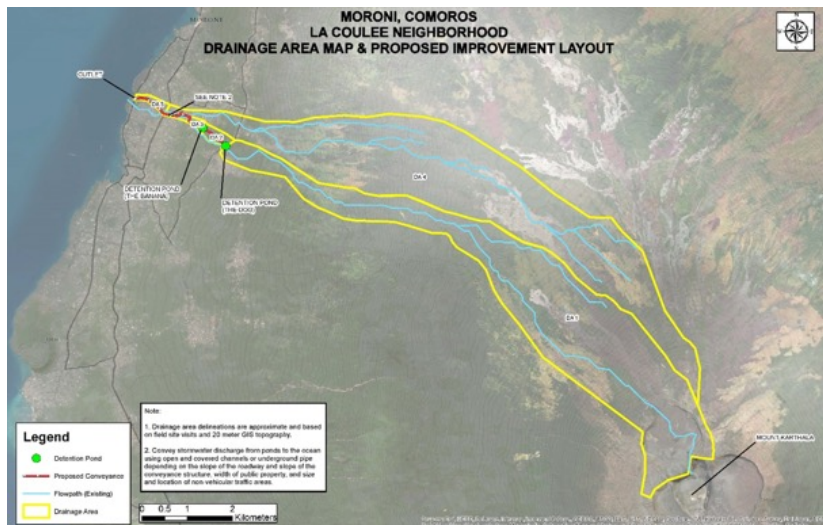


Figure 2: Catchment area ending in La coulee neighbourhood

As per Figure 2, there is a second large drainage area (DA 4) that bypasses the Dog Pond. The proposed conveyance system, has sufficient capacity approximately 98% of the time. The assumption was made that on average a thickness of 0.5 m topsoil covers the underlying rock. The conveyance system consists of 1,911 m of open/closed concrete lined ditches, 87 m of 450 mm HDPE pipe and one concrete outlet structure.

### Implementation strategy and planned activities

The proposed drainage solution is a conveyance storm water network consisting of approximately 1,911 meters of 1 meter (width) by 1.6 meter (depth) concrete channel and 1.5 meter diameter, and of one detention pond with a storage volume of 10,509 m<sup>3</sup>. It has been selected after many local consultations and field work assessments considering various flood reduction options for the area. A system of open and closed concrete lined channels is proposed along the trajectory presented in the map in figure 1, along existing roads. The majority of the drainage channel would be made of reinforced concrete and underground pipes would be required in some sections. The primary objective is to divert the flow of excess storm water away from communities. Particular attention will be paid during the design phase to the inflow structures so that they can appropriately channel the flow of water into the built drains.

The planned activities for this sub-project are (*for the budget references, see Annex 1*):

1. Preparation of detailed documentation, including technical specifications, detailed topographic survey, bill of quantities and detailed design (e.g. complex connections such as corners, intersections with roads, etc.) (*to be charged to Output 1.1 – see Budget Note A and to BL82*).
2. Selection and contracting of a local contractor (*administrative tasks to be charged to Output 1.3 – see Budget Note C*)
3. Recruitment of unskilled labour among community members (*administrative tasks to be charged to Output 1.3 – see Budget Note C*)
4. Works execution from downstream to upstream:
  - i. Excavate trenches and dig the detention pond (*to be charged to BL83, BL84 and BL88*).
  - ii. Construct the detention pond (*to be charged to BL88*).
  - iii. Install drains (*to be charged to BL85*).
  - iv. Install connections underneath roads (*to be charged to BL86*).
  - v. Implement the connections from open/closed channel to closed/open channels (*to be charged to BL86*).
  - vi. Provide on-site technical assistance, monitoring and supervision (*to be charged to BL82*).
5. Setting up a mechanism for maintenance (see below on sustainability) (*expertise to be hired to be charged to Output 1.3 – see Budget Note C*).

### Social, economic and environmental benefits

- Approximately 18,000 people (of which 10,700 are female) will have their lives, assets and livelihoods better protected from the impacts of strong water flows coming from upstream in La Coulee neighbourhood;
- Communities will benefit from improved drainage overall sanitary situation, decreasing risks of water-borne diseases and related outbreaks;
- Extended population will benefit from safer conditions to use critical infrastructures and services located in the area such as hospitals, markets and mosques.

## Sustainability

Ensuring proper maintenance mechanisms of such an infrastructure will be crucial. Importantly, communities will be involved in the construction works as much as possible through labour-intensive activities, to increase the level of ownership and awareness of the critical role played by this infrastructure investment. At the level of the targeted neighbourhoods, proper maintenance/cleaning mechanisms will have to be set up, under the main responsibility of the local population, in coordination with the city council, so that an efficient functioning of the installed drainage system can be secured, especially during the rainy season.

Parallel awareness-raising activities will be carried out, highlighting the importance of keeping the drainage ditches clean and the relation between waste dumping and clogging of ditches, flooding and diseases. Knowing that the drains regularly get clogged with waste, the related sub-project on solid waste management (see Sub-Project Fiche 5.4.3) is inherently linked to the sustainability of this drainage intervention.

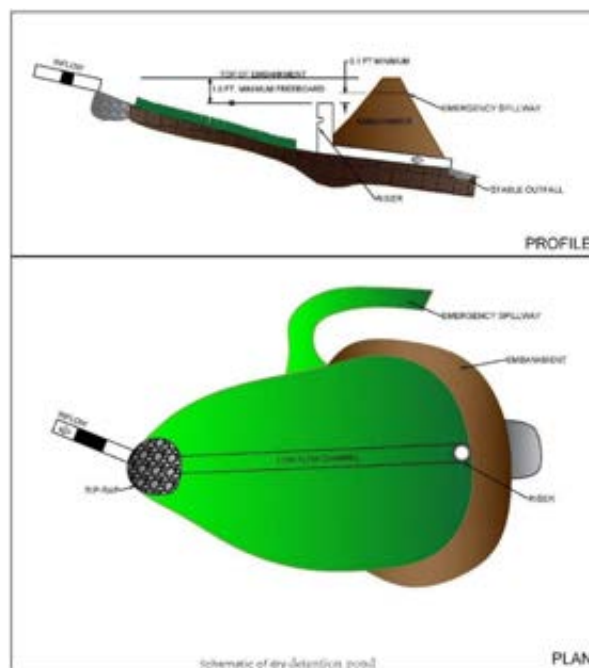


Figure 3: Schematic design of the detention pond

## **SUB-PROJECT FICHE 5.4.2: Establishment of community-managed rainwater harvesting systems in La Coulée neighbourhood**

### Overview

This sub-project aims to improve access to safe drinking water in La Coulée neighbourhood through the installation of community-based rainwater harvesting systems made of ferro-cement water storage tanks with adjacent iron roof structures.

Access to safe drinking water in Comoros has been identified as a national priority and one of the main obstacles for achieving adequate adaptation to climate change in Moroni city. At national level only 26% of the population has access to running water in their houses, while the most common mean for water provision is harvesting and storing rainwater (33.5% of the population).

In La Coulée neighbourhood in Moroni, mainly inhabited by poor people coming to the capital city and seeking for a job, the situation is particularly critical. Lack of access to safe drinking water causes the spread of water-borne diseases (in particular diarrhoea, cholera and typhoid) considering the existing deficient drainage and solid waste management systems (to be addressed through other two sub-projects under this project proposal), resulting in stagnant and polluted waters and poor sanitation conditions. Most of the neighbourhood's population survives with rainwater harvested through various methods, however only few households with enough means are able to build proper water storage tanks or buy and harvest sufficient water from other sources. During the different consultations held with community representatives of La Coulée (see **Annex 4** for detailed information about consultations in Moroni), the strong need to build a community-managed rainwater harvesting system was clearly expressed.

The proposed tanks in ferro-cement will allow communities to harvest rainwater using roofs and store it. Corrugated iron sheets will be used and a first flush system installed. This redirects the first part of the water coming out of the gutter away from the tank to prevent any debris do enter it. Additionally, a proper fine screen to stop debris from getting into the water will be integrated, and a cover to stop direct sunlight from entering.

### Implementation strategy and planned activities

Ferro-cement elements are made by constructing a frame from thin steel rods (rebar) that is then covered with a metal mesh to create the required shape. Then thin layers of sand and cement are plastered over, resulting in a hard, strong finish, ideal for a water tank. Importantly, it is best to position the tank in a place that is shaded and easy to access. The tanks to be installed are the following: 4 community-managed tanks of 10 m<sup>3</sup> each on public/municipal land with rainwater harvesting roof structures of 110 m<sup>2</sup>, 65 m<sup>2</sup>, 175 m<sup>2</sup> and 105 m<sup>2</sup>; 50 tanks of 5 m<sup>3</sup> each on private land to serve the

poorest/most vulnerable households for groups of 4 houses. The volume of each tank is based on the roof surface and rainfall characteristics.

Considering the above, the planned activities for this sub-project are *(for the budget references, see Annex 1)*:

1. Preparation of technical specifications, bills of quantities and detailed designs *(to be charged to Output 1.1 – see Budget Note A and to BL89)*.
2. Recruitment of local master builders and aide-workers among community members *(to be charged to BL90 and BL92)*.



Figure 4: Identified locations for installing the 4 community-based rainwater harvesting systems in La Coulée

3. Implementation of the construction works *(to be charged to BL90, BL91, BL92 and BL93)*.

4. Setting up a mechanism for community management and maintenance (see below on sustainability) *(to be charged to Output 1.3 – see Budget Note C and to BL89)*.

#### **Social, economic and environmental benefits**

Approximately 4,000 people among the poorest and most vulnerable living in La Coulée neighbourhood (see **Annex 2** for data and information on marginalized and vulnerable groups), especially women, older persons and persons with disabilities, will benefit from improved access to clean water, reducing outbreaks of water related diseases and health related risks.

#### **Sustainability**

Ferro-cement for making the water storage tanks is a construction technique that has the advantage of being applied anywhere, including remote areas or places where it is hard to get particular types of building materials (e.g. pre-cast concrete, metal or large plastic tanks), as it is done on the spot and is quite cost-effective. People can be trained and the technique can be replicated elsewhere.

A local community association will be responsible for management and maintenance of the rainwater collection system. They will be involved from the beginning of the sub-project, trained and equipped to ensure that water is kept clean and safe, and is fairly distributed among the population of La Coulée neighbourhood, targeting the poor and the most vulnerable. Workshops and awareness raising activities will be organised with the local population to ensure that the installed rainwater harvesting systems are used sustainably.



Figure 5: Ferro-cement tanks built on the spot in a remote area in southern Mozambique in 2011

### **SUB-PROJECT FICHE 5.4.3: Improving solid waste management in La Coulée and Médina neighbourhoods**

#### **Overview**

In the Medina, a drainage system already exists. However, due to the amount of waste preventing the water to flow normally, the system is currently not functioning, which creates serious problem such as the spread of diseases and flooding. In fact, due to the location of the market uphill, whenever it rains the water flows down and floods the Medina with dirty water and waste. A proper cleaning and maintenance would be an efficient way to make the Medina cope with floods by intervening on solid



waste management. It will be also important to intervene on solid waste management in La Coulée neighbourhood to secure the long-term functioning of the drainage construction planned under this project proposal (please see Sub-Project Fiche 5.4.1).

The city of Moroni suffers from a crucial lack of capacity for solid waste collection and management as a result of financial, technical and organisational limitations. The failure of waste collection and treatment result from many factors such as the insufficiency of transport equipment, the lack of qualified service providers and the weak awareness of population continuously dumping waste in the nature or informal dumpsites.

This intervention will thus focus on improving the municipal capacities to deal with solid waste management and raise awareness among citizens in the Medina and La Coulée neighbourhoods with aim to turn these neighbourhoods more resilient to floods.

### **Implementation strategy and planned activities**

Equipment will have to be adapted to the characteristics of the Medina and La Coulée neighbourhoods, characterised by narrow streets and steep slopes. The following activities are planned (*for the budget references, see Annex 1*):

1. Diagnosis of sanitary conditions (*to be charged to Output 1.1 – see Budget Note A and to BL94*).
2. Development of a solid waste management work plan by the municipality in collaboration with community representatives, including collection circuits, recycling strategy (sorting, recycling, composting) equipment management, maintenance and financial mechanisms (including tax collection) (*to be charged to Output 1.1 – see Budget Note A and to BL94*).
3. Purchase and distribution of equipment (wheelbarrows, gloves, waste sorting bins, etc.) (*to be charged to BL95 and BL96*).
4. Introduce waste collection/separation points in the two neighbourhoods using adapted containers through awareness raising at the community level (*to be charged to BL97 and BL98*).
5. Involve communities in related maintenance and cleaning needs to increase ownership (*to be charged to BL97 and BL98*).
6. Establish public-private partnerships with micro-entrepreneurs for waste management and organise specific trainings (*to be charged to BL99*).

### **Social, economic and environmental benefits**

- Waste collection points will be selected in a participatory manner, including the Medina and La Coulée community representatives as well as marginalized and vulnerable groups and women. Particular attention will be given to the accessibility, safety and suitability of the locations.
- Selective sorting will be able to reduce costs of waste treatment but will also allow creating jobs.
- The risk of disease outbreak will be considerably reduced by the improvement of sanitary conditions.

### **Sustainability**

One of the most important aspect of waste management is capacity building, as it is really important that not only local authorities but also the population understands the urgency of this issue. Therefore, to ensure the long-term efficiency of the intervention, educating people is absolutely necessary. Also, the municipality will be responsible for collecting and allocating funds for maintaining the waste treatment centre through its annual budget based on the subsidies received from the central government. Finally, some projects are currently being implemented at the city level and ready to joint efforts to improve solid waste management. This intervention will work in close collaboration with the local NGO *2mains* currently installing a waste sorting and recycling centre to be conclude by end of 2018 (see Part II, Section G).

1. Train the city council to efficiently manage, budget and allocate the necessary resources to solid waste management;
2. Develop a strategy for public education and awareness raising leveraging participation of schools' children and using user-friendly and popular communication tools (radio, Mosque, etc.);
3. Conduct awareness raising campaign about the relation between waste dumping and the consequences during heavy rain events such as the blocking of drainage system, flooding problem and spread of diseases;
4. Carry out awareness raising campaigns and trainings including local leaders for appropriate waste separation.

## **SUB-PROJECT FICHE 5.4.4: Setting up a flood early warning system in La Coulée neighbourhood**

### **Overview**

In order to improve community capacities to face floods in La Coulée neighbourhood, an early warning system will be set up with both automated river and weather stations.

The country already has an early warning system in place for cyclone and volcanic eruption for Ngazidja (Grande Comore) Island. However, even this system does not take into account flood-related events. It appears necessary to develop an early warning system for La Coulée to monitor, forecast and give the alert ahead of a flash flood caused by an extreme rainfall event, taking into account response strategy to prepare communities to react. In this process, specific attention will be given to coordination and communication mechanisms between national, municipal entities and communities, as this aspect has been identified to be a

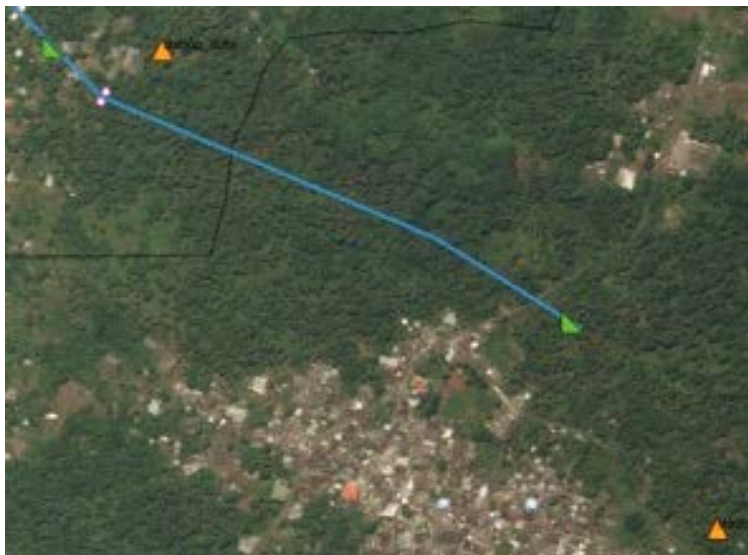


Figure 6: Map locating the EWS interventions: automated weather stations (yellow triangles) and river water gauges (green triangles)

weak point in the lessons learnt from previous early warning system initiatives in Comoros.

### **Implementation strategy and planned activities**

The following activities are planned (*for the budget references, see Annex 1*):

1. Set up two (2) automated river gauges and two (2) automated weather stations to be installed in La Coulée and upstream, including reception computer equipment for real time monitoring by the Meteorological Institute (*to be charged to BL101, BL102 and BL103*).
2. Develop an early warning system plan, including communication strategy and training on the alarm system and escapes routes in La Coulée neighbourhood (*to be charged to BL100 and BL104*).
3. Develop a communication and coordination strategy, counting with national and municipal authorities as well as community representatives, on the use/maintenance of river water gauges and warning, including automatic alarm and/or radio, phones and megaphones (*to be charged to Output 1.3 – see Budget Note C and to BL100*).

### **Social, economic and environmental benefits**

- The total population of La Coulée (18,000 people, of which over 60% are women) will benefit from being informed and knowing how to react when a flash flood occurs;
- Ensure fully participatory planning taking into account the special needs of marginalized vulnerable groups and gender sensitive to design the EWS and identify escapes routes.

### **Sustainability**

In the context of Moroni, it is particularly important to work in close collaboration with the relevant national institutions, especially the meteorological services and the General-Directorate for Civil Security (DGSC), to implement an efficient early warning system. Water gauges, weather stations and the flood early warning system will operate under the coordination and supervision of these two institutions in close collaboration with the city council and the concerned communities. Therefore, to ensure the full sustainability of the intervention, the following activities need to be carried out:

- Strengthen capacities of municipal staff and DGSC for management disaster risk management;
- Conduct awareness raising campaign on the operation of the warning system and evacuation routes as well as regular drillings;
- Improve coordination and communication mechanism between DGSC, the city council, community members and the meteorological services.