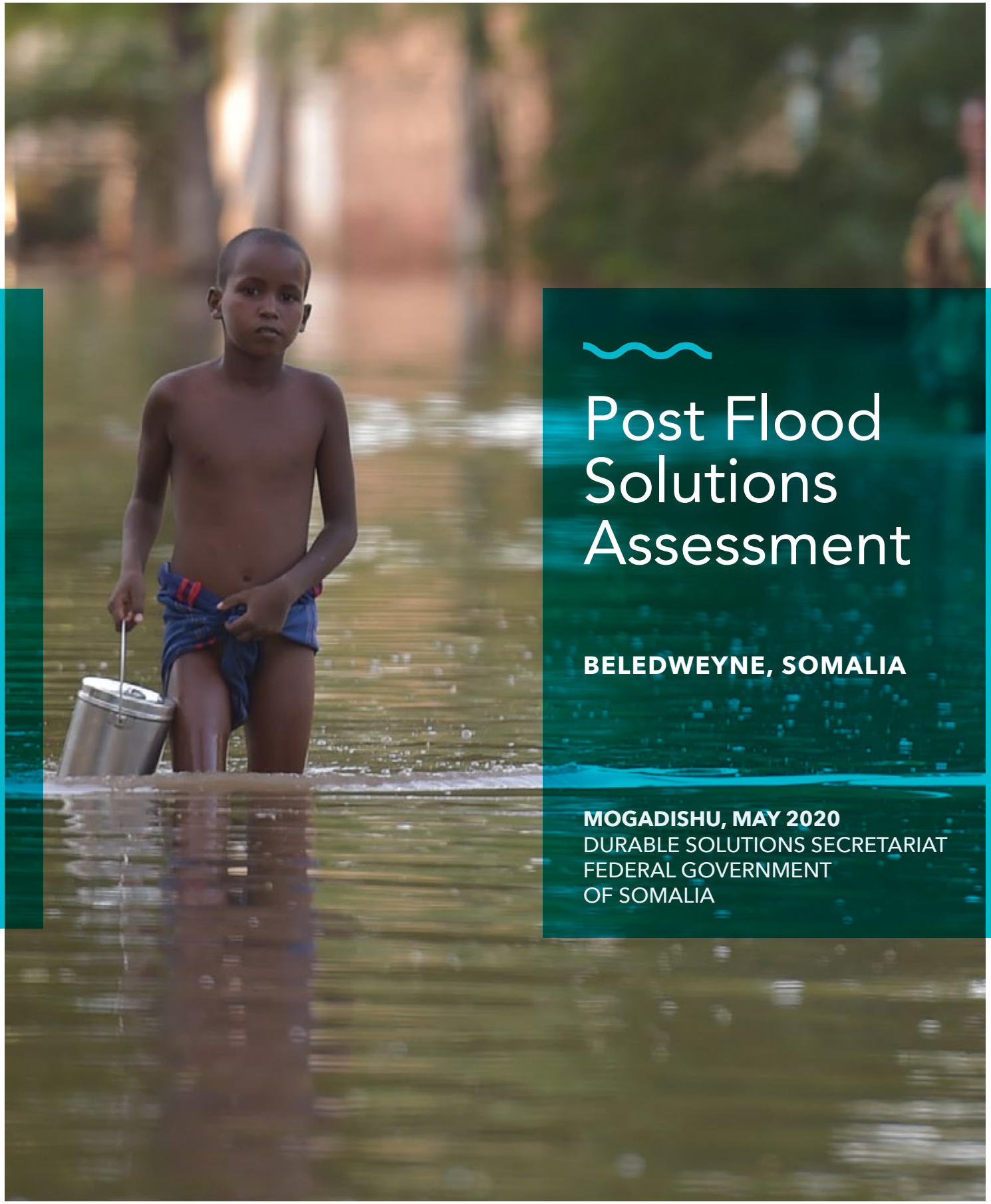
THE FEDERAL GOVERNMENT
OF SOMALIA



Post Flood Solutions Assessment

BELEDWEYNE, SOMALIA

MOGADISHU, MAY 2020
DURABLE SOLUTIONS SECRETARIAT
FEDERAL GOVERNMENT
OF SOMALIA

Post Flood Solutions Assessment
Beledweyne, Somalia
May 2020

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List of Abbreviations and Acronyms

AWD	Acute Water Diarrhea
CSA	Climate Smart Agriculture
DECC	Directorate of Environment and Climate Change
DNS	Directorate of National Statistics
DSS	Durable Solutions Secretariat
FAO	Food and Agriculture Organization
FGS	Federal Government of Somalia
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GIS	Geographic Information System
IDPs	Internally Displaced Persons
KII	Key Informant Interview
MoHADM	Ministry of Humanitarian Affairs and Disaster Management
MoPIED	Ministry of Planning, Investment and Economic Development
MoEWR	Minister of Energy and Water Resources
NCRI	National Commission for Refugees and Internally Displaced Persons
MoAI	Ministry of Agriculture and Irrigation
MoPWRH	Ministry of Public Works, Reconstruction and Housing
NIS	Nordic International Support Foundation
OCHA	United Nations Office of Coordination for Humanitarian Affairs
OPM	Office of the Prime Minister
SWALIM	Somalia Water and Land Information Management
PDNA	Post Disaster Needs Assessment
PDNA RP	Post Disaster Needs Assessment and Recovery Plan
PESS	Population Estimation Survey
RMA	River Management Authority

Glossary of Terms

Deyr	October to November, Minor Wet Season
Gu	April to June, Major Wet Season
Hagaa	July to September, Minor Dry Season
Jilal	December to March, Major Dry Season in Somalia

Acknowledgements

The Post Flood Disaster Solutions Assessment was prepared and conducted by the National Durable Solutions Secretariat (NDSS) under the leadership of the Ministry of Planning, Investment and Economic Development (MoPIED) of the Federal Government of Somalia (FGS) with strategic support from the Office of the Prime Minister (OPM) and technical expertise from Secretariat member including; The Ministry of Humanitarian Affairs and Disaster Management (MoHADM), Ministry of Public Works, Reconstruction and Housing (MoPWRH), Ministry of Interior and Federal Affairs (MoIFAR), Ministry of Women and Human Rights (MoWHR), Ministry of Fisheries & Marine Resources (MoFMR), Ministry of Agriculture and Irrigation (MoAI), Ministry of Energy and Water Resources (MoEWR), Directorate of Environment and Climate Change (DECC) of the Office of the Prime Minister and the National Commission for Refugees and Internally Displaced Persons (NCRI).

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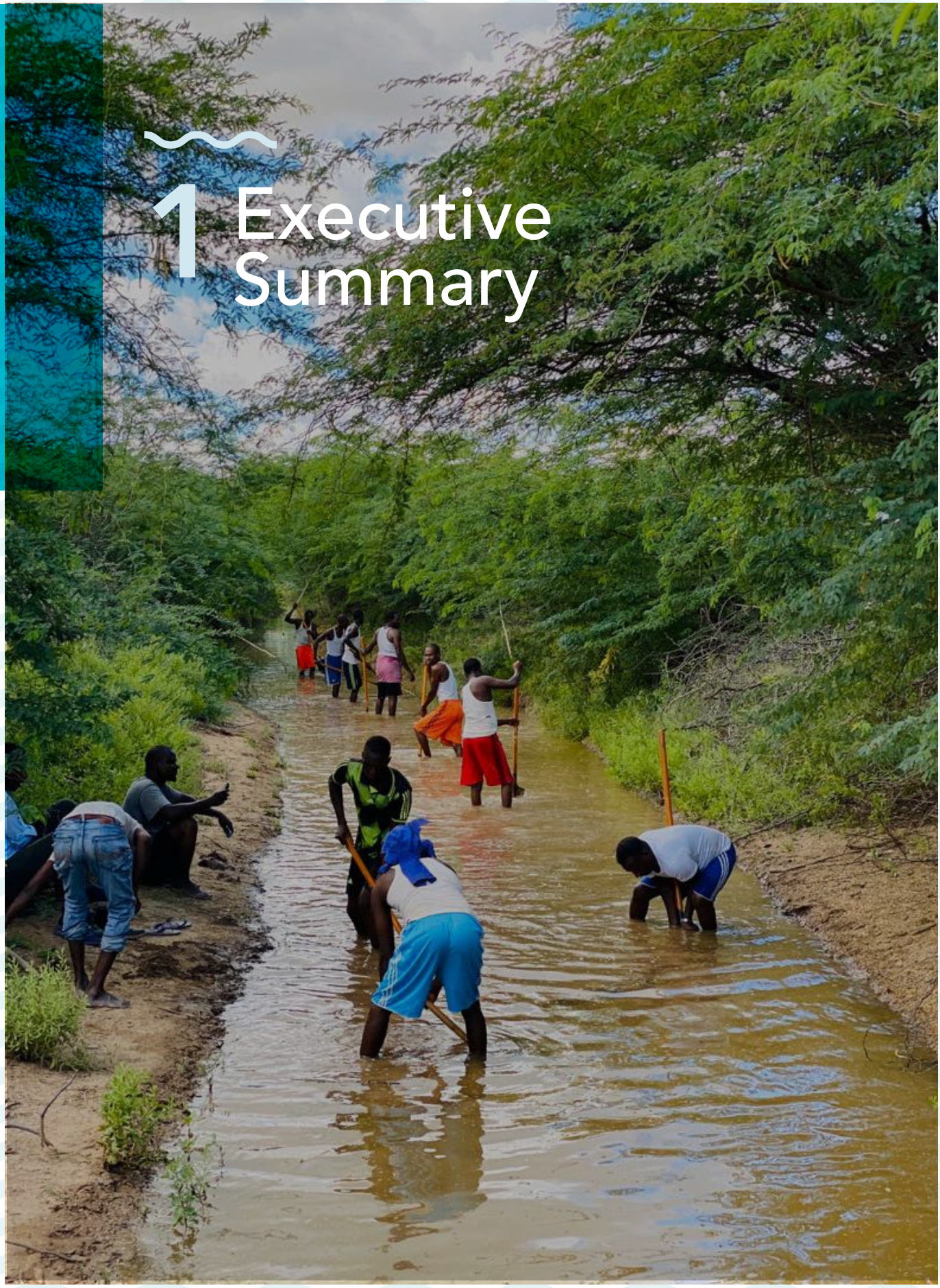
The National Durable Solutions Secretariat

The National Durable Solutions Secretariat is a national entity established in October 2019 and is responsible to lead, coordinate, facilitate, provide technical expertise, high level strategic guidance and oversight on Durable Solutions issues in Somalia through whole-of-government approach and support the attainment of sustainable solutions to displacement in Somalia.

The Secretariat is comprised of fourteen government institutions: Office of the Prime Minister, Ministry of Planning, Investments and Economic Development, Ministry of Interior, Federal Affairs and Reconciliation , The National Commission for Refugee & IDPS, Ministry of Humanitarian Affairs & Disaster Management, Ministry of Labor and Social Affairs, Ministry of Public Works, Reconstruction & Housing, Ministry of Women and Human Rights, Ministry of Agriculture and Irrigation, Ministry of Energy and Water Resources, Ministry of Fishery and Marine Resources, Ministry of Foreign Affairs, Directorate for Environment and Climate Change of the Office of the Prime Minister and Immigration

1 Executive Summary



1.1 Introduction

The Federal Government of Somalia established a joint task force comprising technical experts form six-line ministries, the National Commission for Refugees and IDPs (NCRI) and the Office of the Prime Minister under the National Durable Solutions Secretariat in early March 2020. The team was assigned to conduct Post-flood Impact and Needs Assessment after October 2019 flooding in Beledweyne district, Hiiraan region of the Hirshabelle State of Somalia. The main purpose of the post-disaster assessment is to address the flood impact, recovery, vulnerability and device sustainable solutions for the cyclic floods in Beledweyne. The assessment was designed to identify root causes of flood displacements and provide early and long-term sustainable solutions that includes devising river water management, sustainable environment and economic development recommendations. It is for this reason that the assignment was undertaken between March 14 and 19 and reported on April 2020.

The joint mission attains its objectives and demonstrates the feasibility of government leadership in terms of response and planning. The assessment used the existing government systems and expertise as the basis for departmental collaboration within the government institutions and conducted a detailed study process mapping from the outset. Early planning focused on creating teamwork and understanding the assessment goal and objectives to harmonize the assessment processes and supporting the government team to conduct its work in a more structured way. The assessment was completed successfully and within the time frame set with each department submitting its report, an indication of capacity within the government institutions.

The assessment provides to all stakeholders an integrated Post Disaster Needs Assessment and recommendations on sustainable solutions with infrastructural engineering proposals identifying solutions that are directly addressing the root causes of the flood displacements in Beledweyne. The assessment is done through a multisectoral process to ensure a whole of government approach to durable solutions and acknowledges the interdependency of various sectors. The assessment focuses on three main group of sectors; the productive, social and infrastructure sectors. Finally, the assessment makes recommendations on flood risk management and also the measures needed for sustainable solutions both at the early and long-term phases for a comprehensive post-disaster solutions analysis.

1.2 Purpose

The purpose the assessment is to deliver and document fitting impact analysis, needs assessment and proposes relevant, effective and efficient sustainable solutions with the focus on infrastructure, environment and socioeconomics of Beledweyne district. Recommendations were gathered from all stakeholders so as to improve and inform flood

The assessment was designed to identify root causes of flood displacements and provide early and long-term sustainable solutions

responses, preparedness and future interventions and programming. A community feedback was gathered to help improve government institutions efficiency to address the underlying vulnerability that may have contributed to the extent of the flood disaster's effects and recovery and reconstruction towards strengthening the resilience of the community to better manage future disasters and their risks.

1.3 Objectives

The assessment specific objectives are:

- To evaluate the flood disaster damage, loss and micro-economic impacts of the affected economy and/or local community.
- To assess impacts on the livelihoods, incomes and human development, in terms of the vulnerability and risks of the affected population.
- To obtain feedback and insight from community members on their confidence in local administration and federal government support towards disaster preparedness and post-disaster response support.
- To identify institutional efficiency according the public feedback regarding response level, timing and relevance.
- Hold discussions with residents, officials and other stakeholders to inform future programming designs on long-term solutions for sustainable recovery and reconstruction.
- To produce early medium and long-term solutions and measures for addressing the root causes of flood disasters.
- Engage all stakeholders with the solutions assessment findings and recovery plan within the existing frameworks.

1.4 Context Analysis

Ali Adan Siyad, a local historian and a farmer in Beledweyne recounts the three worst floods in recent history; happening in 1981, 1997 and 2019. In 1981, he remembers how the Somali government response was organized and most effective and feels there is a greater danger of floods due to the absent role of the government and the lack of planning and preparedness. Siyad, his family and the farmers of entire village Tuulo Raaxo were among 231,000 people who have been displaced by the floods in Beledweyne in 2019.

In Somalia, the climate shocks, conflicts, and political and economic instability realities play a powerful role of the two decades long crisis. Structural vulnerabilities, such as high levels of poverty, cycles of floods and droughts, resource scarcity, and young governing institutions (or support for institutions) prolonged the national crisis and hinders efforts towards disaster response and risk management. The country is in a very fragile state-building status quo, caught on improving stability, rule of law and governance, which puts service delivery in general at bay. Thus, putting many citizens' lives in danger and creating hostile and inhabitable environment due to the lack of preparedness of both natural and man-made disasters that are causing cyclical floods and droughts within the country, which makes the situation unbearable for its citizens specially the famers and nomads. These conditions are in no doubt the biggest threat within and a major factor contributing to displacement in the country.

Over the last 30 years in Somalia, recurrent droughts and floods have become more intense, frequent and unpredictable, linked

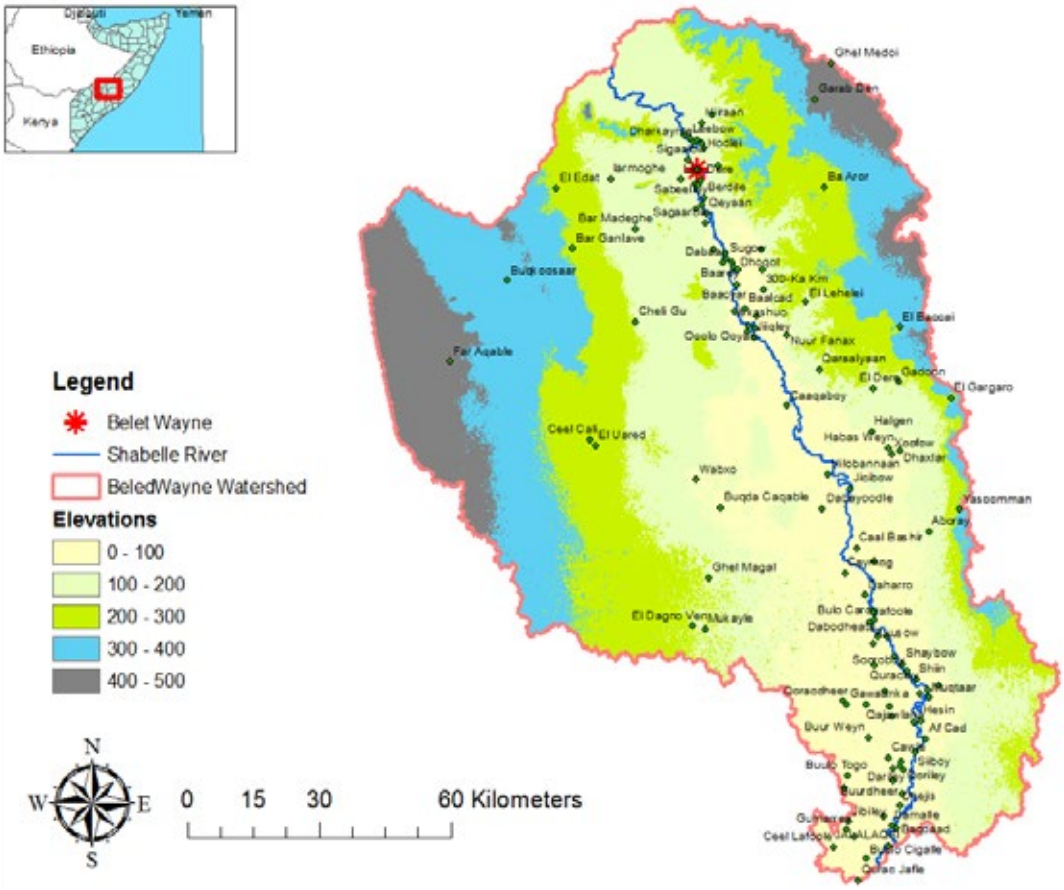
to climate change. In October 2019, floods devastated and displaced many communities, affecting over half a million - or 574,000 people, according to latest reports by the United Nations Office of Coordination for Humanitarian Affairs[1]. Hundreds of thousands of them have been forced to leave their homes and many of them in dire need of clean water, shelter, health and food supplies. Beledweyne district is the worst affected with 231,000 people displaced and Beledweyne town virtually submerged under floodwaters, instability, amid widespread poverty. In addition, the flooding caused significant damage to infrastructure, property, crops, livestock, and delayed planting, including increased risk of malnutrition and water/mosquito-borne diseases as the water slowly recedes, according to the report. This situation is compounded by existing humanitarian needs in an already fragile country.

1 Office for Coordination of Humanitarian Affairs (OCHA), 2019, Somalia's Deadly Drought-Flood Cycle

1.4.1 Brief Description of Shabelle River at Beledweyne Station

Beledweyne, Hirshabelle State is situated in the Shabelle Valley near the Ethiopian border some 330 km north of Mogadishu. The town is an industrial productive zone and is a vibrant commercial hub supplying livestock and agricultural products to local and international markets through the Berbera and Bossaso seaports. Farmers produce maize, soybeans, groundnuts, sesame, sunflower seeds, vegetable

Figure 1. Beledweyne Sub-catchment in Central Somalia



Source: FAO-SWALIM

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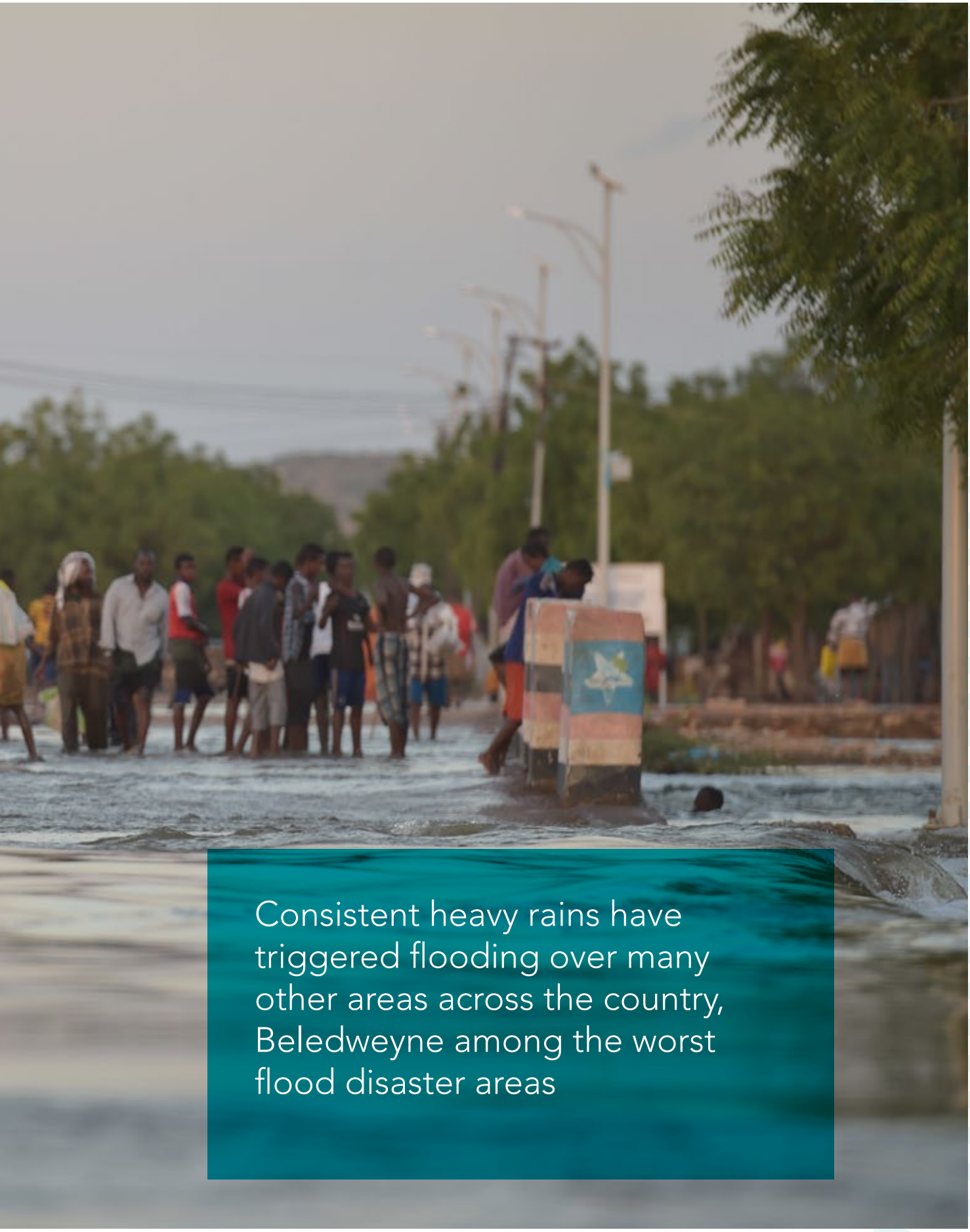


Consistent heavy rains have triggered flooding over many other areas across the country, Beledweyne among the worst flood disaster areas

Table 1. Annual Maximum Discharge for the Shabelle River at Beledweyne

Maximum discharge (m^3/s)	473.6
Minimum discharge (m^3/s)	138.5
STD Deviation (m^3/s)	88.6
CV	19%

Source: FAO-SWALIM

Table 2. Long-term Average Flows in Shabelle River (1963-1990)

Beledweyne Long-term Mean Discharges	
Month	**Mean**
January	14.3
February	13.8
March	30.3
April	80.5
May	152.8
June	82.8
July	57
August	110.7
September	152
October	130.2
November	77.7
December	37.2
Annual	78.3

Source: FAO-SWALIM

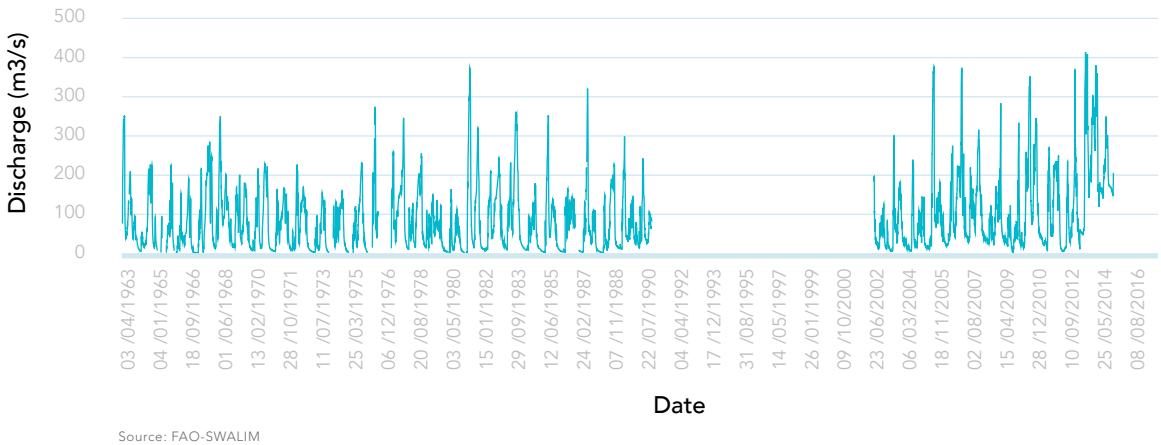
and fruits including mangoes, watermelons, papaya, grapefruits and bananas for export. Beledweyne also has a large livestock market that brings together livestock traders from all over the country.

Beledweyne city is not only flooded by the river overflows caused by rainwater from the highlands of Ethiopia but also flash floods injecting huge amounts of water into the river. The city also rests in a huge depression between mountains that supports an easy flow of flood water from upstream, descending towards the depression zone in the lower stream.

Beledweyne is divided by the Shabelle River into eastern and western sections as depicted in Figure 1. High flows in the Shabelle River is known to cause flooding problems in Beledweyne for the past two decades.

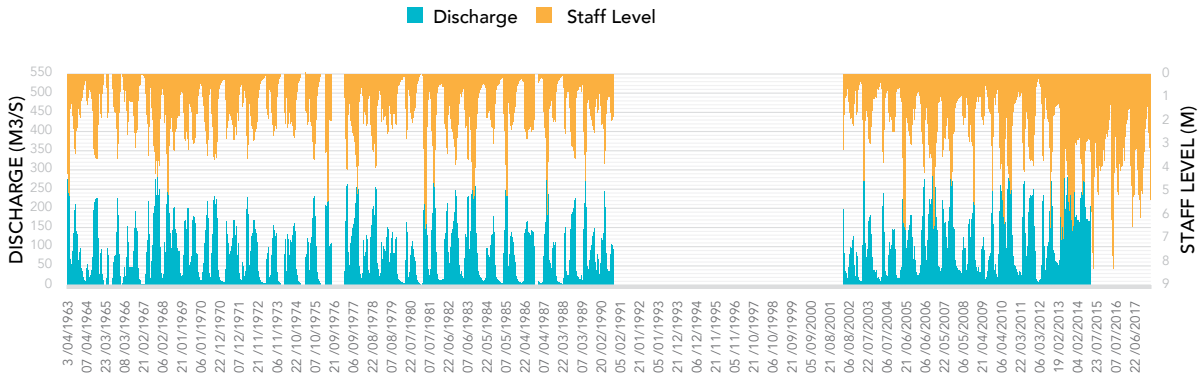
Annual Maximum and Minimum Discharge for the Shabelle River at Beledweyne is presented in Table 1. The annual flows decrease along the river with water being lost through extraction, evaporation and over-bank spillage.

Figure 2. Daily Discharge (Q) of the Shabelle River at Beledweyne Station from 1963 to 2015



Source: FAO-SWALIM

Figure 3. Daily Gauge Height (H) and Discharge (Q) of the Shabelle River at Beledweyne Station from 1963 to 2018



Source: FAO-SWALIM

The river flow within Beledweyne catchment is generally decreasing from upstream locations to downstream locations toward Buluburte. Severe flood level of Beledweyne station is approximately 320 m3/s with river level at approximately at 7.0m.

River flow and water level data for Beledweyne station existed long before the Somalia's independence. It started recording River levels in 1951 though records for the period 1951-1962 are intermittent and their accuracy is uncertain.

During the period between 1963 and 1989, direct river flow measurements were carried out with gaps of missing data. From the end of 1990 to 2002, the Beledweyne station like the rest of other station in Somalia were not monitored and no data is available for this period as the hydrometric network collapsed in the late 1990. Since 2002, FAO-SWALIM has been collecting River discharge (Q) and staff gauge level (H) data though the collection of (Q) stopped since 2015 for security reasons. Figure 2 shows the daily discharge and corresponding water levels of Shabelle River at Beledweyne station from 1963 to 2018.[2]

2 Food and Agriculture Organization (FAO) SWALIM, December 2019, Brief Description of Shabelle River at Beledweyne Station

1.4.2 Heavy Rains Trigger Flooding

Over the past few years, heavy rainfall concentrated across the Horn of Africa. The source of both rivers (Shabelle and Juba) mainly southern and eastern Ethiopia and central Somalia receives favorable widespread rainfall, above average. Consistent heavy rains have triggered flooding over many other areas across the country, Beledweyne among the worst flood disaster areas, according to Famine Early Warning Systems Network (FEWS NET), Global Weather Hazards Summary report in April 2020. Forecast additional rains maintain a high flood risk. FEWS NET reports also that the recent increase in rainfall has helped to relieve short term 30-day rainfall deficits over some dry parts of the region including eastern Ethiopia and Somalia, which have experienced a slow start to the March – May season. The Rainfall forecast of the 2020 Gu rains continued to be spread across the country with a decrease in precipitation with light to locally moderate rainfall is forecast across the region. However, additional rainfall will maintain an elevated risk for flooding over many previously flooded areas in Somalia. Flood originated still at Open points 15, overflows points 5, potential for flooding 4 as shown in table 3 below.

Table 3. Breaking Points of Shabelle River at Beledweyne Station

Criteria	#BP	Description of the Breakage Point (BP)
OPEN (O):	15	Breakage point where a recent (< 1 year) flood originated is still open and has no signs of intervention/rehabilitation on the latest analyzed images.
OVERFLOWS (Of):	5	Portion of the river embankment where water overflows have recently occurred (< 1 year). Overflows generally take place along shallow portions of the embankments, which could be submerged for several hundred meters during the flood.
POTENTIAL (P):	4	A point along the embankment where there is potential for flooding to occur. Clear indicators of flood potentiality, such as recent vegetation removal, embankment erosion, closed with sandbags, water spillage or other signs representing a potential embankment weakness have been identified. These indications are supported by DTM analysis, multi-temporal analysis and/or direct field observations.
Closed (C):	4	Breakage point where an old (>2 years) flood originated and that has been fixed using either heavy machinery or sandbags. No flooding has been detected recently, so this point may be considered CLOSED as the situation is stable. Interventions by heavy machinery are permanent, while those by sandbags are temporal, subject to new floods.

1.5 Methodology of the Assessment

1.5.1 Assessment Design

This assessment adopted a cross-sectional study design using mixed methods approach with both qualitative and quantitative data collected. Quantitative data was collected through a desk review of previous assessments, reports and documents to quantify the extent of floods impact, create greater level of understanding and secure funding for sustainable water management solutions based on the results framework from the beginning of the assessment. The literature review pertaining to drought and floods was undertaken, with a particular focus on what can be done in creating sustainable solutions. Qualitative data sources were used as the primary source of data collection in this study that includes Feedback from the floods affected population was also gathered, Key Informant Interviews (KIIs), Focus Group Discussions (FGDs) and observational checklists were administered. The questions were tailored to each individual respondent. They are very helpful in identifying factors that facilitate or affect programme achievements.

1.5.2 Sample Selection

A total of 12 FGDs (infrastructure project – 4 and floods and durable solutions project – 8), 71 KIIs (infrastructure project – 8 and floods and durable solutions project – 71) and two observations (all in the infrastructure project) were conducted as part of this evaluation. These were distributed across the project regions with stratified purposive sampling method to mobilize participants for the KIIs and FGDs across the project sites. There were between 6 and 12 homogeneous participants in each FGDs conducted. The FGDs and KIIs were conducted while ensuring sufficient representation by marginalized communities, gender and, dissimilarity among the beneficiaries. Study instruments were administered to respondents in order to capture both the outcomes as well as the level of exposure to the various project interventions. Tables 4 show the number of KIIs, FGDs and observational checklists conducted per project and by region during the evaluation.

Directorate of National Statistics (DNS) of the MoPIED carried out the qualitative aspect to further findings of the flood assessment. As per Somali Health and Demographic Survey household listing in 2017, the total number of enumeration areas in Beledweyne Urban was 144 with 17,555 households (HH). Using the average household size for the Population Estimate Survey (PESS) 2014, the total population of the town was 105,330 persons. This derived from the total number of households multiplied by the average household of (6). The sample size of this assessment is determined using Sample Size Calculations for a Proportion for Cluster Surveys calculator available on-line. There are 17,555 households with a "margin of error" of 5 percent and a "confidence level" of 95 percent, the survey sample size is 432 households. The total sample size is distributed between the four villages of Beledweyne namely; Kooshin, Hawataako, Howlwadaag and Bundoweyn. The underlining assumption is that how floods effected these villages are totally different, so according to the magnitude of the flood effect to the villages is based to proposition size of the number of the households to be interviewed. So following is how the distributions of interviewed household is managed between villages; Hawo taako being the most flood effected village in Beledweyne town is allocated 34.7 percent HH to be interviewed out of 432 households which is equivalent 150 HH, while Kooshin is the second village in terms of the flood impact 29.9 percent is allocated which is equal to 129 HH while Hawlwadaag belongs 20.4 percent for 88 HH and finally Bundoweyn is assigned to interview 15 percent and as household will be 65 HH. As per this distribution of the survey sample, the total households sampled is 432 HH and all of these households were interviewed. The sample size gives consideration of the current urban setting between host community sampled 377 HH and Internally Displaced People (IDPs) sampled 55 HH respectively.

Table 4. Data Collection Approaches

Villages	# of FGDs	# of HH Interviewed	# of Observational Checklists
Kooshin	1	150	2
Hawataako	1	129	1
Howlwadaag	1	88	2
Buundoweyn	1	65	2
Total	**4**	**432**	**7**

↑ Assessment Team Arriving in Beledweyne

↑ Minister of Planning of Hirshabelle Chairing the Local Government Meeting

↑ Initial Meeting with Hirshabelle and Beledweyne District Authorities

↑ Focus Group Discussion with the Local District Community

↑ Data collection in Kooshin, Hawataako, Howlwadaag and Buundoweyn Villages

↑ Meeting with the Beledweyne Flood Committee

↑ Discussion on Flood Mitigation with Beledweyne Flood Committee

↑ Training of the Assessment Enumerators

↑ Shabelle River Assessment in Beledweyne

↑ Members of Durable Solution Secretariat Assessment

1.5.3 Data Management and Analysis

The survey enumerators were trained in data collection using observational checklists and KII and FGD guides. Study tools were pre-tested and reviewed before actual use to ensure their accuracy in pursuit of the study findings. Data collection procedures were standardized across different participants. Check questions were used in the tools to check for consistency. There was thorough validation of data for consistency and completeness by interview team members before departure from the venue. Proof reading was done by the study core team on raw data and data after transcription to ensure that the findings from the analyzed transcripts were reliable. The collected raw data was given numerical codes for identification and for reference during the interviews. All interviews were collected through mobile phone applications.

1.5.4 Ethical Considerations

There was adequate stakeholder briefing before and during the evaluation. An informed consent was sought from all subjects prior to participation in the study. Those who declined to participate were not discriminated against in any way and their decisions were respected. Through interviews, participants reserved the right to respond to or decline to respond to the respective questions. Personal identifiers of participants e.g. location or contact information were not in any way produced in the analyzed information and raw data was confidentially kept under lock and key and only accessible to the core study team.

Given consideration to localized disputes, conflicts, safety and security that may arise during assessment, the data collection team was trained in the application of 'Do No Harm' principles and conflict mitigation. The training identified community dividers, conflict drivers, and sources of tension, capacities for violence, and connectors and local capacities for peace. Steps were taken to consider and mitigate the likelihood of localized disputes and conflicts between communities in target areas to make sure inclusive FGD are conducted.

There were no monetary benefits to the study participants. Any benefits were likely to outweigh any anticipated risks. However, some challenges were encountered during data collection exercise, such as security risk for the data collection team, limited access to some remote villages and poor level of cooperation from some departments and local communities at the district level.

1.5.5 Assessment Limitations

The assessment is a rapid survey and not a census and its scope and findings are limited to Beledweyne district, an area severely impacted by the flooding and not extended to the other areas also impacted by the floods throughout Shabelle River and Juba River in Somalia. This was a pilot evaluation to be expanded in the near future. Therefore, the assessment recognizes the need to conduct further assessments to include other towns and districts affected by the floods in 2019. The assessment report does not evaluate existing rebuilding efforts since there were no considerable and measurable recovery and solutions programs put in place post-flood disaster in Beledweyne, October 2019. The assessment has not allocated particular strata for the IDPs but has captured their needs within the host community. The assessment does not focus on the valuation of the impact and losses of the floods in Beledweyne in 2019 bit utilizes the data from the World Bank Somalia 2019 Flood Impact Needs Assessment (FINA).

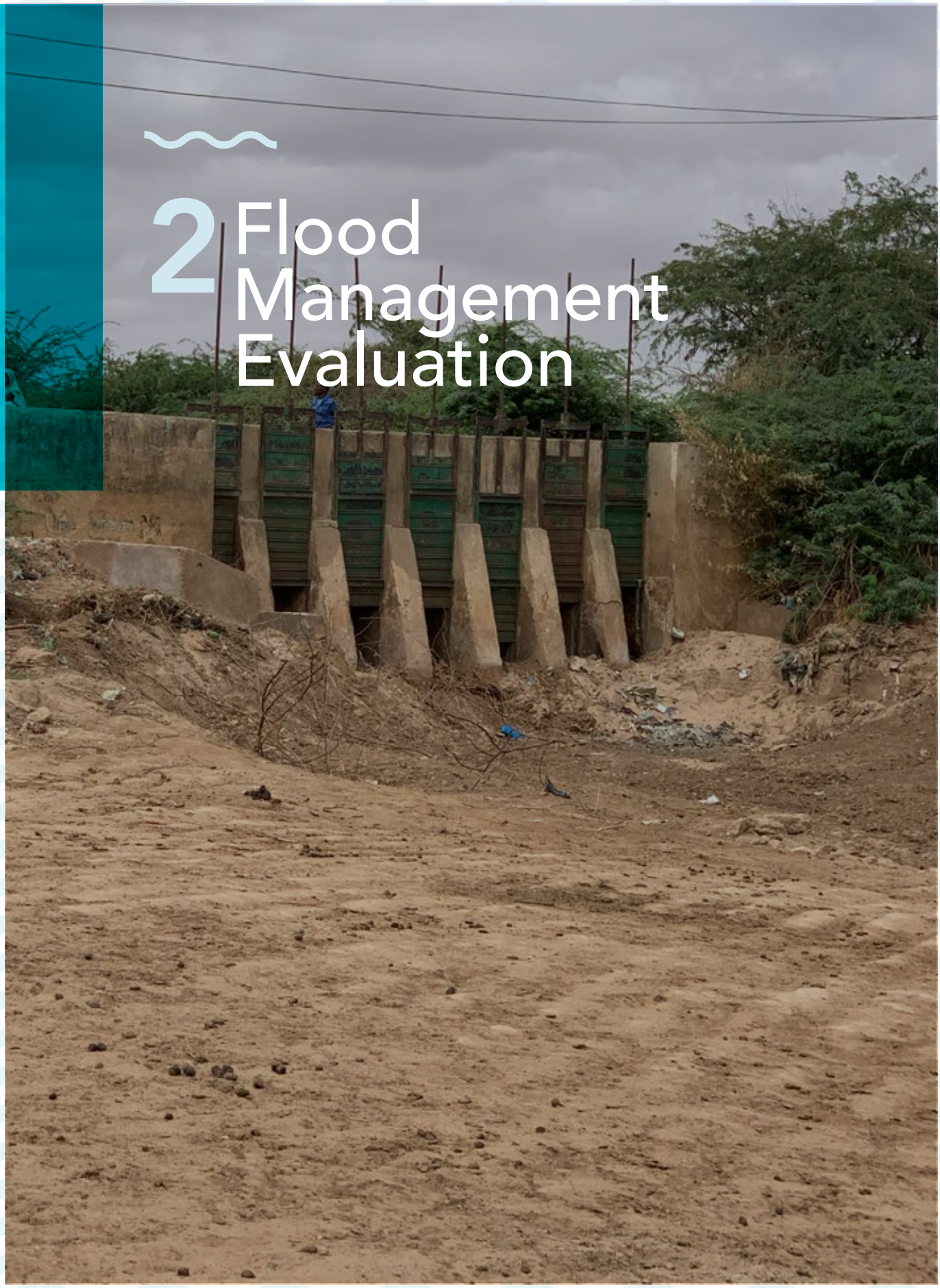
Table 5. Description of the Various Assessment Domains

Criteria	Description
Preparedness and Awareness	Assessing pre-flood measures to ensure effective response in preparing the population of future flood emergencies in a timely manner. This is to evaluate the key components of emergency preparedness that includes the issuance of early warning and temporary evacuation, education and public awareness and preparedness plan that is linked to the disaster management.
Response	Taking measures to reduce adverse impacts to the population and material values and infrastructure at risk during flooding. Pre-planned activities are implementation and validated, and Institutional efficiency regarding disaster management is tested critically around protection of critical infrastructure, rapid needs assessment and safe shelters.
Resilience and Recovery	Considering measures to assist the affected community to rebuild itself. The post-flood recovery and rebuilding period is viewed as an opportunity to restore improved and better basic lifeline services and make long-term development goals and plans towards finding sustainable solutions to flood disasters. Also, what are the lessons learned from previous disasters to help reduce vulnerability and preventing future loss.
Solutions	Assessing early and long-term solutions to the recurrent flood cycle and identifying key interventions that can be taken forward to prevent another cycle of floods in 2020.

1.5.6 Assessment Criteria

The assessment used quantitative information gathered from the project implementation documents, quarterly and monthly reports, supervision reports as well as beneficiary perceptions about the project gathered through the FGD and KII guides as well as the project outputs observed using a standardized observation checklist. The data gathered has been analyzed thematically but being in cognizance of the assessment guide in Table 5.

2 Flood Management Evaluation



Government agencies conducted Post-flood impact and needs assessment and collected significant volume of data to measure the flood emergency management stages of preparedness, response and recovery.

Flood emergency management is the most important role in overall flood management, policymaking, planning and implementation. Evaluating the emergency management operation responsibilities and how they are shared between agencies respective of their mandates, and if operational frameworks, committees and regular meeting are in place. This type of information is collected from the key informant interviews, focused group discussions and observation checklists provide insights to the climate hazards impact and magnitude and how this actual threat is interrupting the socioeconomic development of all residents in Beledweyne district.

The local population lifestyle, socioeconomic situation and how they are dealing with the disaster and support systems are also recorded in this assessment. Both community and local authority level feedbacks were collected to evaluate the response level and to identify the gaps in flood disaster response and preparedness in Beledweyne. The KIIs, FGDs and observation checklists were used as the primary data collection methods. The hydro-meteorological data and flood forecasting information were used as secondary data from reliable sources.

2.1 Vulnerability and Risk Assessment

The pre-flood emergency preparedness is important to ensure effective response by creating an understanding about the flood risk and device plans and activities to reduce by decreasing the magnitude of hazards, prevent exposure and diminish vulnerability of flood-prone communities. It is about taking pre-flood measures to ensure effective response in preparing the population of future flood emergencies in a timely manner. At this stage the assessment evaluates the key components of emergency preparedness that includes the issuance of early warning and temporary evacuation, education and public awareness and preparedness plan that is linked to the disaster management. However, reducing flood risk requires understanding of the combination of flood hazards in Beledweyne. Since 1951, Shabelle river flow and water level data for Beledweyne station existed, pointing the combination of river overflow water and flush rainwater flooding injecting huge amount of water to the area. Lately, the rainfall forecasts show the source of Shabelle river mainly southern and eastern Ethiopia and central Somalia receives favorable widespread rainfall, above average. Consistent heavy rains have triggered flooding over many other areas across the country, Beledweyne among the worst flood disaster areas.

Heavy rainfall concentrated across the Horn of Africa is an actual threat as a result of the climate change. Assessment survey participants

Flood emergency management is the most important role in overall flood management, policymaking, planning and implementation

Table 6. Climate Hazards Impact and Magnitude

Climate Hazard			Cause of Flood			2019 Flood magnitude Compared with Previous Floods			
Hazard	Flood	Drought	Heavy Rainfall	River Overflow	Others	Less	15	3.5	3.5
Frequency	369	63	102	325	5	Equal	15	3.5	7.0
Percent	85.4	14.6	23.6	75.2	1.2	More	349	80.8	87.8
Cumulative	85.4	100.0	23.6	98.8	100	Don't know	53	12.3	12.3
						Total	**432**	**100**	**100**

identified climate shocks as main hazard that mostly have affected the area during the past five years. The assessment categorically shows respondents identifying flooding more serious and impactful than droughts in Beledweyne and surrounding villages. However, when asked about the causes of floods in their locality, majority of the respondents 75.2 percent (325 household out of the 432 household) stated overflow of river as the main cause of the floods. While 23.6 percent (102 of household out of 432 household) stated heavy rainfall as the main cause of the floods. The remaining 1.2 percent (5 household out of the 432 household) gave different answers that related to poor urban planning and lack of river water management in the area.

The latest flood in 2019, duration and frequency were both reported to be higher than average compared to previous floods experienced in the area, lasting more than 30 days with the total frequency of about 276, according to total survey participants with small variation in their responses. Also, 80.8 percent (349 out of the total 432 households) states that the magnitude of the 2019 flood was greater compared to previous years' floods in the area. Table 6 below illustrates that the majority of the people understand and agree on the main climate hazards that have affected, the causes of flood in their locality, how the comparison of the magnitude of the 2019 flood with previous other floods that impacted the area.

2.1.1 Generally Agreed Vulnerability Findings

The primary data identified some common ground in feedback from community level findings that are relevant experiences after flooding risks of Hazard, Exposure, and Vulnerability. In their responses they understand the problem but show lack of leadership and local initiatives. These communities show low consideration about the environmental and evidence amounts when asked about waste disposal behaviors. Also, they are not satisfied with the government response in the 2019 flood. Table 7 below illustrates some mostly agreed upon responses to survey questions posted to community level participants.

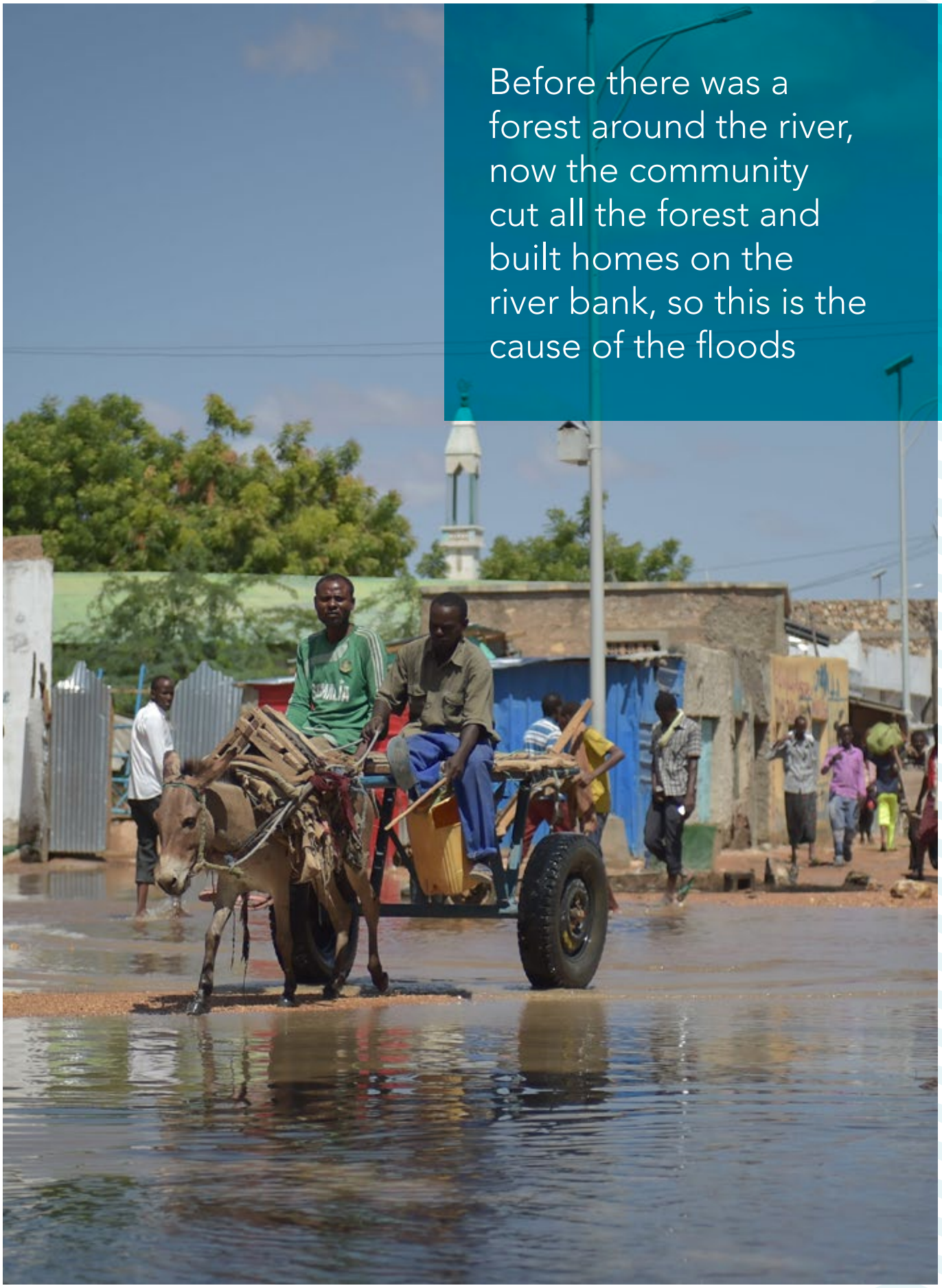
The primary data also identified some common ground in feedback from authority level findings. Local government officials acknowledge getting information about the weather hazard warnings and forecasts but are sufficiently sharing with the community to mitigate risk. There is the resources limitation issue and lack of experience in public outreach and communications also exist. Table 8 below illustrates some mostly agreed upon responses to survey questions posted to authority level participants.

Table 7. Community Level Findings

	Community Level findings Mostly Agreed Upon
1	**What do you think are the causes of flood in Beledweyne?**
	↘ The community is fully agreed that the causes of floods are river overflow and huge rainfall. ↘ There is no withdrawal of river sand for flood mitigation by providing more storage capacity. ↘ Before there was forest around the River, now the community cut all the forest and builds homes to riverbank, so that is cause the flood. ↘ Malfunction of Waraboole floodgates and lack of spillway in generally.
2	**Do you think relief organizations are important during disaster situations?**
	↘ Yes, relief organizations are significance during disaster situation particularly during flood situations
3	**How do you think the community can help itself in managing floods, and is there any disaster management committee in your district?**
	↘ There is not permanent disaster management committee but each and every village of the Beledweyne organize their own and help each other what they can afford.
4	**Do you get help from the government/authority or other institution after the flood? If yes what type of help?**
	↘ So far there is no support from government side
5	**Are there any waste management companies? Then, how do you manage your waste?**
	↘ Yes, there are some waste management companies they collect the garbage from the houses and streets while host community pay small amount of service and then the company dispose the waste somewhere about 4-5 kilometer away from Beledweyne town
6	**What is distance of the river to the waste disposal area?**
	↘ It is not far away from the river it is about 2-3 kilometers
7	**Do experience environment recovery after flood? (Positive effect of flood on the environment)? If yes, what are those effects?**
	↘ Yes, when floods occur there is positive effect of flood on the environment because after the flood, it is very good for livestock because huge grass emerges, it also increases the seasonal cultivation
8	**What do you propose for finding durable solutions for the recurrent floods cycle?**
	↘ Start withdrawal of river sand for flood mitigation by providing more storage capacity ↘ Evacuate the people around river ↘ Rehabilitee Waraboole floodgates and spillway in generally ↘ Build water reservoir to utilize the water

Table 8. Authority Level Findings

	Authority Level findings Mostly Agreed Upon
1	**What do you think are the causes of flood in Beledweyne?**
	↘ The community is fully agreeing that the causes of floods are river overflow and huge rainfall. ↘ There is no withdrawal of river sand for flood mitigation by providing more storage capacity. ↘ Before there was forest around the River, now the community cut all the forest and built homes on the riverbank, so that is cause the flood. ↘ Malfunction of Waraboole floodgates and lack of spillway in generally
2	**Were you able to tell that flood would occur? And how did you know? And how you convey the community that floods will occur?**
	↘ Yes, we can forecast that floods are due, this information we get different sources such traditional ways we always communicate the Shabelle Region by telephone and when rainfall is more. We inform the community those floods through media and microphone and use vehicles with microphones.
3	**Is there any way you are being prepared to deal with hazards/floods and does the district having a disaster management committee? If this committee in place how does you communicate and warn about floods?**
	↘ For flood preparedness; first we organized identify place, Ceeljaale, where there is suitable place to inhabit during floods. ↘ We deployed the police to ensure the security issue. ↘ We deal with floods to evacuate the people from the risk places, to the safety places. ↘ In some area in Beledweyne such Howlwadaag village displace each other, because they have safety places. So, we call the institutions to help the displaced people. ↘ Yes, there is committee that was announced as ministry level and regional level from the Hirshabelle state.
4	**Do you experience environment recovery after flood? (Positive effect of flood on the environment)? If yes, what are those effects?**
	↘ Not too much except helps forest as well irrigation of agriculture and better to the livestock but comparing advantages and disadvantages, disadvantages are more than advantages
5	**What do you propose for finding durable solutions for the recurrent floods cycle?**
	↘ Start withdrawal of river sand for flood mitigation by providing more storage capacity ↘ Evacuate the people around river ↘ Rehabilitating Waraboole floodgates and spillway in generally ↘ Build water reservoir to utilize the water



Before there was a forest around the river, now the community cut all the forest and built homes on the river bank, so this is the cause of the floods

© AMISOM Photo / Tobin Jones

Table 9. Flood Affected (Yes/No) Flood Displaced

Indicators	Flood directly affected			Flood displaced					
	Yes	No	Total	Same region	Other regions	Same district	Other districts	Never	Total
Frequency	308	124	432	78	7	33	10	304	432
Percent	71.3	28.7	100.0	18.1	1.6	7.6	2.3	70.4	100.0
Cumulative	71.3	100		18.1	19.7	27.3	29.6	100.0	

2.1.2 Flood affected and Displaced Population

The October 2019 flood displaced almost half of the Beledweyne district residents due to the poor level of preparedness. The Households directly affected by the floods during last three years; the survey participants shared the impact of the flood according to their proximity to the most affected zones, those close to the area were directly impacted representing majority of residents in Beledweyne and surrounding villages. The Households directly affected by the floods during last three years - About 29.6 percent (128 out of total 432 household participants) of the total respondents stated that their families were displaced during the 2019 Beledweyne district by the flood. Total of 78 households out of the 432 households are placed to same region and the percentage 18.1. The 7, 10, and 33 households out of the 432 households were displaced other regions, same district, and other districts, shown in the table 9 below.

2.1.3 Poor Socioeconomic Status

In terms of the socioeconomic impact findings, farming was identified as the to main sources of income of the majority of the local households, while small business and trading are the second level source of income for many in the area. Recent flood devastated both the agriculture and small business-based economy of the area. Agricultural yields reduced to almost zero in 2019 and early 2020 because of the flood, where much of the produces were transported to neighboring regions the flood also affected the transportation lines of goods to and from Beledweyne.

In terms of home ownership almost half of the households surveyed 48.8 percent own their space, which is 211 families out of the 432 household participants. On the other hand, 221 of household out of the 432 household equivalent 51.2 percent where either renting, living relative space or inhabiting public space temporarily. Unemployment is very high in the area about 20 percent stated that they have no primary source of income while above 30 percent also said they have no secondary source of income. However, the highest ratio of those with income identified either farming or small business as the primary or the secondary source of income. Tables 10 below illustrate the main sources of income for the household both primary and secondary, as indicated.

Domestic products classification does not qualify industrial standard categorization since this is a small farming community within a less developed region. Therefore, the household domestic animals are traditionally part of the gross domestic household items accounted in the economy as one. The survey shows radio as preferred medium with 53.7 percent of household's ownership of radio compared to

Table 10. The Sources of Income

Sector	None	Farming	Livestock	Fishing	Small business	Trading	Remittance	Employed	Other	Total
1. Primary Source of Income										
Frequency	85	84	3	4	115	16	7	43	75	432
Percent	19.7	19.4	0.7	0.9	26.6	3.7	1.6	10.0	17.4	100
Cumulative	19.7	39.1	39.8	40.7	67.4	71.1	72.7	82.6	100	
2. Secondary Source of Income										
Frequency	130	52	10	1	108	2	4	38	87	432
Percent	30.1	12.0	2.3	0.2	25.0	0.5	0.9	8.8	20.1	100
Cumulative	30.1	42.1	44.4	44.7	69.7	70.1	71.1	79.9	100	

Table 11. Household Possessions of Domestic Products and Animals

	Radio		TV		Refriger-ator		Wash M		Car		Boat		Camel		Cattle		Coat		Donkey	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
Yes	232	53.7	109	25.2	41	9.5	39	9.0	24	5.6	13	3.0	23	5.3	57	13.2	96	22.2	55	12.7
No	200	46.3	323	74.8	391	90.5	393	91.0	408	94.4	419	97.0	409	94.7	375	86.8	336	77.8	377	87.3
Total	432	100	432	100	432	100	432	100	432	100	432	100	432	100	432	100	432	100	432	100

only 25.2 percent households' ownership of television. Other domestic products such as refrigerators and washing machines are very rare and 18.5 percent have the luxury to own and afford the high electricity bills. Also, a very small sum percent about 30% of the total households surveyed possess a reliable means of transportation including car, boat, donkey, horse and camel. Therefore, the productivity, industrial and service value of these household items are minimum and extremely have zero economic activity value. Table 11 below summarizes household domestic products and domestic animals of value.

2.1.4 Poor Housing and Energy Conditions

The main material of the household walls only 94 percent out of the 432 households after observation were stone/brick/block, which represents only 21.8 percent. The rest of the households about 78.2 percent walls are made of wood, mud, grass, dirt, which are all soft spots for flash flooding and puts them in a high-risk category. Only 4.4 percent of the total survey households stated living under concrete roofing and only 5.6 percent are living under tiles roofing. The large percent of the housing in the area are using Iron sheets to build the house roof. Earth represents the most common house flooring with 61.8 percent of the households and only 31.3 percent of the houses are made of cement floors.

62.7 percent of the local residents have access to electricity as the main source of energy for lighting. Only 5.8 percent have access to renewable energy or solar energy as their main source of energy for lighting. A large percentage of the community about 31.6 percent have no access to electricity and are

Table 12. Housing and Source of Energy

Type of Housing	F	%	Roofing	F	%	Floor Material	F	%	Housing Status	F	%
Stone/Brick/ Block	94	21.8	Concrete	19	4.4	Cement	135	31.3	For Rent	122	28.2
Mud and wood	64	14.8	Tiles	24	5.6	Roof tiles	8	1.9	For Relative	28	6.5
Wood only	29	6.7	Iron Sheet	289	66.9	Wood	9	2.1	Others	71	16.4
Iron Sheets	177	41.0	Wood	69	16.0	Earth	267	61.8	Own Land	211	48.8
Grass / Dirt	60	13.9	Palm leaf/sod	31	7.2	Other	13	3.0	Total	432	100
Other	8	1.9	Total	432	100	Total	432	100			
Total	432	100									

Source of Energy for Lighting and Cooking					
For Lighting	F	%	For Cooking	F	%
Electricity	271	62.7	Electricity	25	5.8
Solar Energy	25	5.8	Gas	1	.2
Kerosene	7	1.6	Kerosene	219	50.7
Firewood	25	5.8	Firewood	172	39.8
Torch	90	20.8	Livestock dung	1	.2
Other	14	3.2	Other	14	3.2
Total	**432**	**100.0**	Total	**432**	**100**

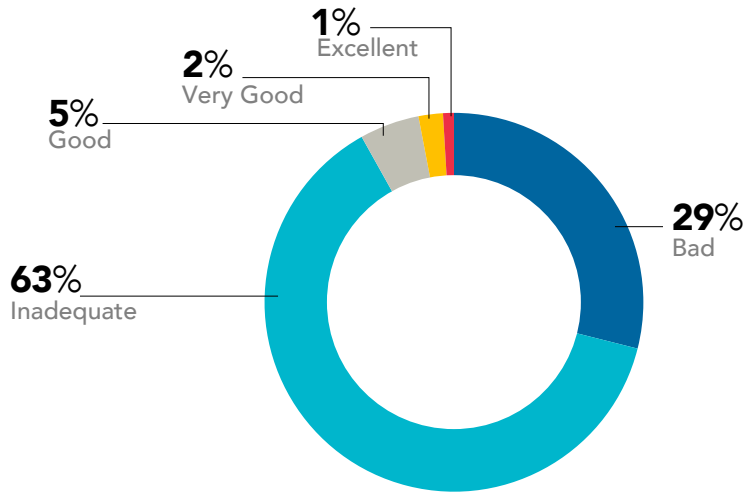
F Frequency **%** Percent

using torches, burning wood for lighting fire or using some type of kerosene lighting. However, only about 6 percent can afford to buy use electricity or gas for cooking, 90.5 percent majority of the households are burning wood or using kerosene-cooking stoves. Table 12 below illustrates the house types and source of energy for the residents in Beledweyne.

2.2 Flood Emergency Preparedness Planning

In 2019, there was no evidence to suggest the existence of community level flood emergency preparedness committee, plan and activities to minimize loss to life and livelihoods as a result of flooding. Post-flood assessment survey suggests that 72.7 percent of the total participants stated that there was no existing committee for flood emergency management. The assessment also finds that Beledweyne Flood Committee largely comprising of prominent businesspeople and local community was established post-flood disaster in Beledweyne to assist the affected community to rebuild itself. Beledweyne floods risk management is an essential component in the development process for saving lives and achieving sustainable solutions for development. Since measures of preparedness, response, recovery and rehabilitation are systematically applied in the risk management, preparedness plans should be adequately linked to disaster management entities at the local, district, state and national levels. This method improves the ability of a community in a vulnerable area to respond to floods and to reduce the risk. Assessment record shows inadequate level of preparedness during flood

Figure 4. Level of Emergency Preparations of the Government or Other Institutions



emergencies in Beledweyne. The table and chart table show lacking in the ability of anticipation and preparation of the government or other institution to floods. 28.9 percent (125 out of total 432 households) stated that the value ability of the government or other institutions' preparations to the floods was bad. While 63.0 percent (272 out of total 432 households) agreed that the emergency preparations of the government or other institutions were inadequate. Only 5.2 percent (22 out of total 432 households) said the preparations of the governments or other institutions were good.

2.3 Flood Emergency Public Awareness

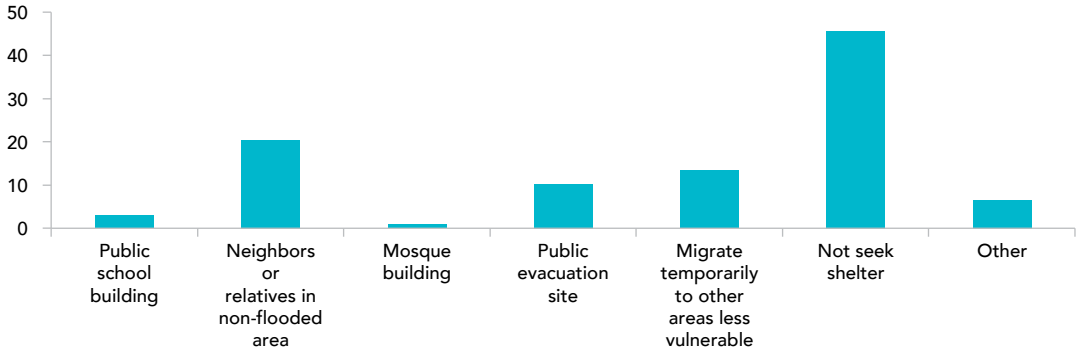
Local authorities at the Hirshabelle State level and district administration both failed to address the public awareness componenet of the flood risk management in 2019. Because of the inefficency at the authority level, the impact of the flood was greater and could have been reduced if prepearedness measures were address before the flood occurred. When it comes to preparedness in terms of public awareness assessment survey, participants indicated the lack of flood and disaster readiness in the area impacted. A large majority

Table 13. Preparedness, Awareness and Medium

The household Preparedness for Floods			
	Frequency	Percent	Cumulative Percent
Yes	31	7.2	7.2
No	401	92.8	100.0
Total	**432**	**100.0**	
Awareness of the risk of floods			
Yes	143	33.1	33.1
No	289	66.9	100.0
Total	**432**	**100.0**	
Through which medium was the information passed			
TV	32	7.4	7.4
Radio	67	15.5	22.9
Traditional ways	56	13.0	35.9
Not got any information	270	62.5	98.4
Other	7	1.6	100.0
Total	**432**	**100.0**	

of the survey participants responded negatively when asked if they were prepared for both the flood and its impact. The survey recorded household preparedness for floods, 92.8 percent responded negatively in their feedback. The lack of awareness evidence described by

Figure 5. Access to Public Evacuation and Shelter



66.9 percent of the total survey participants perfectly corresponds with the lack of disaster preparedness where 92.8 percent responded negatively regarding household preparedness of the risk of the flood in 2019. The table below shows that most of community had no prior awareness of the threats of the floods. The minority percentage of those with level of awareness implied that they are get information about the treat of floods certain specified mediums radio being the top medium followed by traditional ways and TVs which is for the urban setting only. This also shows that a higher percentage of the people that were impacted by the floods prior the disaster happening, which puts more people at risk at any given time during flood seasons.

2.4 Early Warning and Evacuation

In flood emergencies early warning and evacuation shelters are fundamental and critical activities to shift people from flood-prone areas. The assessment team couldn't locate local government records to show early warnings issued on how local people can take action during flooding in 2019. There was extreme flooding and people had no information on where to go to save their lives. About 60 percent (256 households out of 432 total) said they couldn't evacuate from the flood-prone area due to poor flood emergency management in Beledweyne. There were no identified shelters for evacuation and 54.4 percent of the survey participants built new shelters during flood emergency and 45.6 percent of the flood displaced individuals or families were not able to seek shelter at a public evacuation site. Floods displaced people were seeking shelter with relatives or were forced to temporarily migrate distance areas. The chart below shows only 10.2 percent of the flood displaced people were able to get access to public evacuation sites available in the area.

Figure 6. Institutional Emergency Responses During Flood

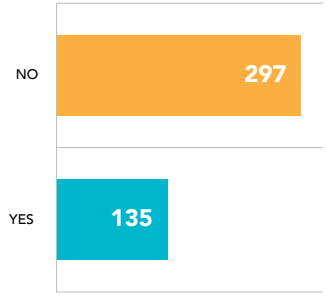
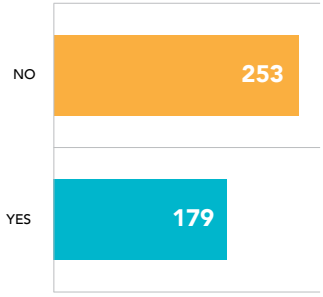


Figure 7. Support from Government or Humanitarian Agencies, after the Flood



2.5 Flood Emergency Response Evaluation

Flood emergency response relies on government institutions to take the leadership role to provide prevention, protection and evaluation measures. Since 1991, more than two decades, the role of government was minimal in lead flood emergency response in Beledweyne. Therefore, government institutions' response was minimized to security protection and evacuation of the residents during flood. The Federal Government rapid needs assessment is done four months after the actual flood disaster in Beledweyne. Local authorities are limited in terms of resources and do not know how to deal with the flood emergency response at this stage. However, humanitarian partners responded with emergency aid working with the state and federal governments in Hirshabelle State. Agencies drawing from own resources supplied stockpiles and reprogrammed their programs and with their partners managed to respond to the ongoing floods crisis reaching at least 105,000 with assistance countrywide. The assistance has however been disparate across the regions and falls short of the time-critical scale up required to avert a disaster, according to OCHA 2019 Flood Response Plan. The humanitarian agencies plan requires $72.5 million to implement flood response in 29 affected districts including Beledweyne. Some $25 million has been made available by mid-November 2019 but another $47.5 million is required to meet the immediate needs of the flood-affected population or the total population in affected districts of 5.3m in Somalia. Mohamed Kalil, Médecins Sans Frontieres (MSF) Humanitarian Affairs Advisor for Somalia summarized this best and said, "The aid distributed so far has been a drop in the ocean." In an article titled; Floods leave thousands of people vulnerable and in need, published on MSF website on 19 November 2019[3].

Flood emergency response requires high-level coordination between all stakeholders and the implementation of pre-planned activities during flooding to reduce the adverse impacts to the population and material values and infrastructure at risk. In October 2019 flooding, this was not the case, according to the assessment findings. The table and chart below show that the government or other institutions provide prevention measures. The survey indicates that on 31.3 percent equivalent of 135 households responded positive to government or any institutions response in providing preventions and protection measures. The majority of 68.8% (297 households out of the 432 households) responded negative to government or institutions response in providing prevention and protections measures. That implies most of the community agreed that the flood emergency response was not effective to prevent or reduce the disaster risk. Also, when asked about getting support from government institutions or humanitarian agencies 58.6 percent (253 out of

3 Médecins Sans Frontières (MSF), 2019, Floods in Somalia MSF's Emergency Response. Retrieved from https://reliefweb.int/report/somalia/floods-leave-thousands-people-vulnerable-and-need

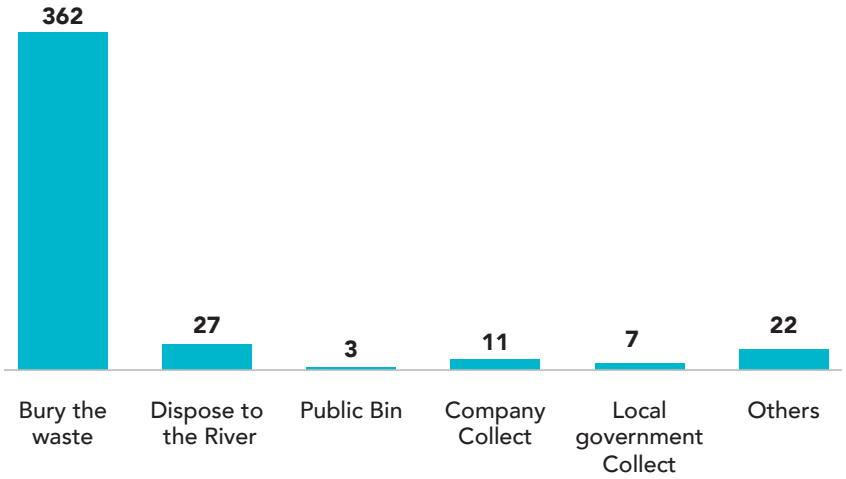
total 432 households) said they never received any support from government or humanitarian agencies. While 41.4 percent stated that they received some level of support from government or humanitarian agencies responding to the flood disaster in Beledweyne.

2.6 River Water Contamination a Waste Management

Improper waste management and lack of environmental awareness was observed during assessment. Soil and water pollution can all be a result of improper waste management and occurrence of either river water becomes contaminated with hazardous materials. Evaluation findings from both the KIIs and FGDs across the environment study areas demonstrate high level of river water contamination due to the lack of protection as a critical infrastructure and poor methods of waste management. Plastic waste represents 82.6 percent of the total waste generated in the area, which is really alarming in the fact that large amount of plastics is making into the river. A poor basic method of waste management such as incineration, landfills and recycling are also part of the problem. According to survey findings only 10 out of 432 households are properly managing their waste using public bins and local government garbage collection trucks for disposal. Majority number of 359 out of the 432 households is not aware or not interested garbage collection services as a proper method of waste management. Also, majority of the city residents and people interviewed don't feel the importance of proper waste management and are not willing or unable to meet the cost of private garbage collection services. About 6.3 percent openly stated they dispose waste to the river while many others were reserved to discuss about river contamination. However, Pit Latrine and Flush Toilets are the most commonly used way of human disposal. The tables and charts provide some basic information about local behavior on waste management.

River is the main source of water supply for the whole city and water is pumped out of the river, while sewage is directly disposed to the river. This is making contamination level very high and rising by the day, causing many water bourne diseases that common in Beledweyne. Pandemics such are cholera out-breaks are very common in Beledweyne during dry seasons as the river water streamflow and quality gets very poor and contaminated. On top of that, the urban population rapidly growing and without immediate intervention the negative environmental impacts increase risk not only to the district population but also to all inhabitants of other cities along the Shabelle River.

Figure 8. Common Waste Management Practices



Pandemics such are cholera out-breaks are very common in Beledweyne during dry seasons as the river water streamflow and quality gets very poor and contaminated

Figure 9. Types of Waste Generated in Beledweyne

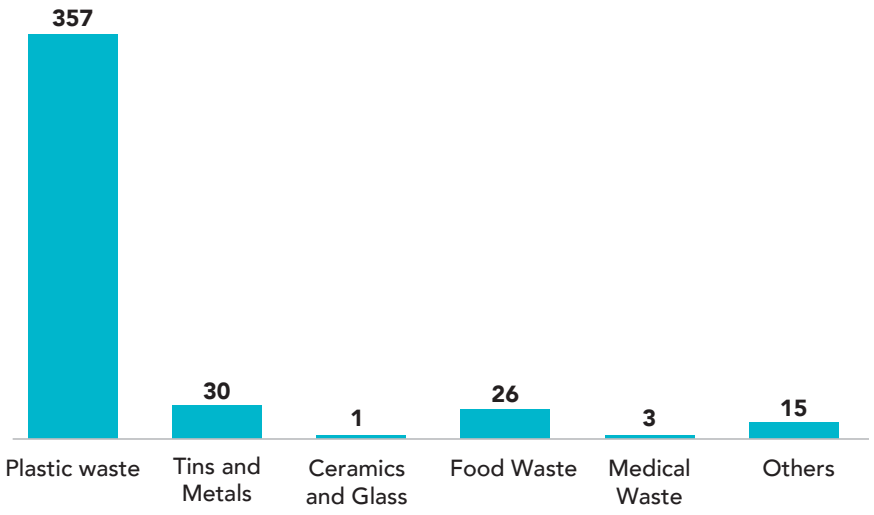
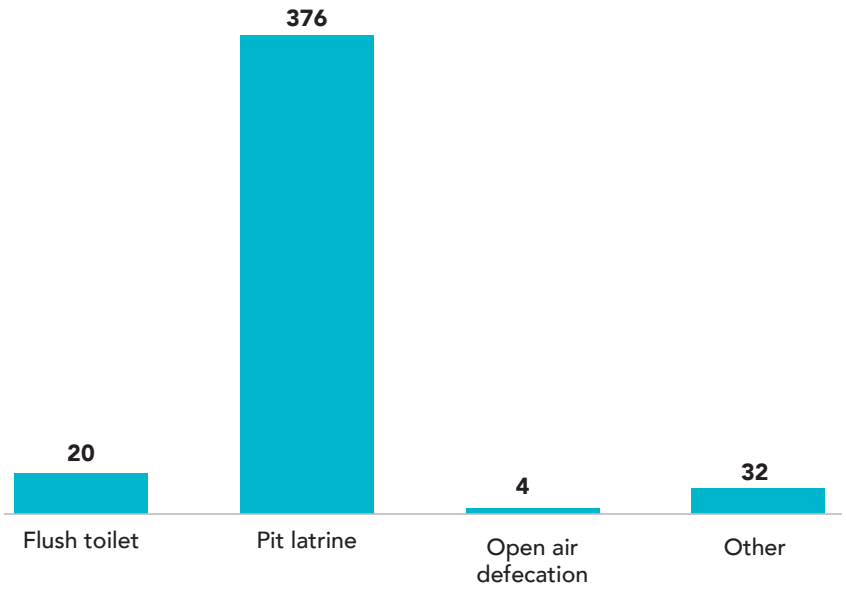


Figure 10. Human Waste Disposal



2.7 Key Findings

1. **Beledweyne district** flooding is triggered by heavy rainfall concentrated across Somalia and the Ethiopian highlands that causing Shabelle river overflow and rainwater flash flooding that is injecting huge amount of water to the area.

2. **Besides the natural causes** of river overflow and flash floods from the surrounding hills, there are other factors contributing to the flood disaster in Beledweyne. Some of these factors include weak riverbanks associated with breaching and poor maintenance, poor drainage and blockages within the town, lack of flood emergency planning, absence of urban land use planning that results in unregulated embankment and cultivation of the river by inhabitants, upstream river in Ethiopia without coordination and early warning to the downstream in Somalia, absence of river management authority and lack of public awareness.

3. **October 2019 flooding** affected the entire population of Beledweyne district; displacing 231,000 people and at least 7 people have died, including 2 children. 29.6 percent (128 out of total 432 household participants) of the total respondents affirmed displacement of the whole family during 2019 Beledweyne flooding. Some of these families were displaced to other districts in Hiiraan region while there are still some who were displaced to other regions in the country.

4. **Since 1951,** Shabelle river flow and water level data collection at Beledweyne station existed for further studies to create understanding of the flood risk in the district. Latest data available identified breaking points of Shabelle River at Beledweyne Station that are categorized as; flood originated breaking points that are still open a total of 15, river overflows points a total of 5 and potential for flooding points a total of 4.

5. **During 2019 floods,** there was no evidence to suggest the existence of Community Flood Management Committee for emergency preparedness and planning to minimize loss to life and livelihoods as a result of flooding. The assessment also finds that a Flood Committee comprising largely of prominent businesspeople was established post-flood disaster in Beledweyne to assist the affected community to rebuild itself.

6. **Poor Conditions** of Housing and Energy in Beledweyne contributes to increased impact of flood risk. Only 21.8 percent of residential housing walls are made of stone/brick/block materials to qualify safe shelter during floods. The rest of the households about 78.2 percent walls are made of wood, mud, grass, dirt, which are all soft spots for flash flooding and of high-risk category. Roofing quality also not up to durable standards and only 4.4 percent of the total survey households are living under concrete roofing and only 5.6 percent are living under tiles roofing. The large percent of the housing in the area are using Iron sheets to build the house roof. Earth represents the most common house flooring with 61.8 percent of the households and only 31.3 percent of the houses are made of cement floors.

7. **Poor Socioeconomic Status** increases vulnerability to flood risks of the affected population. Farming was identified as the main source of income of the majority households, while small business and trading are the second source of income for many in the area. Recent flood devastated both the agriculture and small business-based economy of the area. Agricultural yields reduced to almost zero in 2019 and early 2020 because of the flooding. Unemployment is very high in the area about 20 percent stated that they have no primary source of income while above 30 percent also said they have no secondary source of income. However, the highest ratio of those with income identified either farming or small business as the primary or the secondary source of income.

8. **The insignificant level** of flood risk education and public awareness leaves great danger to community living flood-prone areas and the entire district population. Hirshabelle State governmetn

and Beledweyne district administration both failed to address the public awareness componenet of the flood risk management in 2019. Because of the government inefficeince the flood impact was greater and could have been reduced if prepearenss meaures were address before the flood occurred.

9. **Lack of Emergency Preparedness** Plan is also and other factor contributing to the negative impact of the flood emergency in Beledweyne. The is no actual emergency preparedness plan in place, no coordination and information sharing mechanism linking to disaster management entities at the district, state and federal levels.

10. **No Flood Early Warning Systems** in place during 2019 flooding. In flood emergencies early warning and evacuation shelters are fundamental and critical activities to shift people from flood-prone areas. The assessment team couldn't locate local government records to show early warnings issued on how local people can take action during flooding in 2019. There were extreme flooding and people had no information on where to go to save their lives. About 60 percent (256 households out of 432 total) said they could not evacuate from the flood-prone area due to poor flood emergency management in Beledweyne. However, the team located a weather forecasting station that was established in January 2020 by the diaspora community, yet the station needs to be expanded with additional capacitated support staff to handle all relevant tasks.

11. **Local government** should be accountable to the protection of critical infrastructure during Flood Emergency Response. It is necessary to mobilize personnel and machinery – where available – to protect infrastructure, such as levees and retention basins; to remove individuals from facilities at risk, such as hospitals, schools, bridges, or individual houses; and to prevent landslides and disastrous river-bank erosions.

12. **Local government agencies** are expected to assess the immediate needs of affected communities, evacuate population in high-risk areas, activate local search and rescue teams, take immediate remedial measures to repair or restore damaged infrastructure, and seek help from state or national authorities when the scale of the disaster exceeds their capacity.

13. **There were no already identified** safe shelters for evacuation pre-flooding in Beledweyne. 54.4 percent of the survey participants built new shelters during flood emergency and 45.6 percent of the flood displaced individuals or families were not able to seek shelter at a public evacuation site. Floods displaced people were seeking shelter with relatives or were forced to temporarily migrate distance location. Safe shelters should be identified in advance, and evacuation routes leading to designated shelters clearly marked.

14. **Improper waste management** and lack of environmental awareness was observed during assessment. Soil and water pollution can all be a result of improper waste management and occurrence of either river water becomes contaminated with hazardous materials. Evaluation findings from both the KIIs and FGDs across the environment study areas demonstrate high level of river water contamination due to the lack of protection as a critical infrastructure and poor waste management methods.

15. **The water supply** in the town is connected from the river and is contaminated by waste resulting on water borne diseases.

16. **Beledweyne local airport runway** was heavily affected by the 2019 floods stopping emergency response flights into the town. The airport is the only entry point via air for relief operations and needs to be reconstructed to ensure that runway is operational during rains and flood disasters.

3 Disaster Impact and Recovery Needs

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3.1 Social Sector

Housing and Human Settlements

Sector Impact

- The flood enormously damaged the already poor conditions of housing in Beledweyne. Over 70 percent of the city and river basin areas were flooded and over period of one month leaving many still displaced and others with badly damaged and destroyed houses to go back. An estimated 45,500 households were displaced by early November 2019 flooding.
- Basic shelter needs of the flood-affected population still exist and many families are unable to rehabilitate their homes in terms of cost or fear of future flooding in the near.
- As a result of the poor urban settlement and land use planning the flood created land disputes in the area. There are no effective enforcement of the existing Housing, Land and Property regulations to protect and safeguard the assets and properties of flood affected families.
- Those with especial needs, elderly and children are impacted the most and did not receive the attention and care needed during flood emergency and response.
- Floods created logistical and capacity challenges for all the institutions, agencies and community group responding resulting shortage of supplies of basic shelter and non-food items considering the response timeline.
- Rapid urbanization is causing people to dump waste on the riverbanks so that extra land for habitation can be attained and this has a negative impact on the river causing it to decrease the space through which water flows resulting in river overflows or breakages.

Sector Recovery Needs

- Durable Solutions efforts should underline the need to enforce Housing, Land and Property regulation, improve the urban planning and settlement policies to reduce the risk of floods and to protect assets and properties of residents.

- Government institutions with mandates in this sector should scale up early solutions in response and recovery of the flood affected families and providing support to meet basic housing needs, basic non-food items and to provide care those with especial needs, children and the elderly people.

- Housing standards should be improved with innovation and technology to reduce flood risk and emergency shelter supplies should be provided to those in need and stocked for preparedness purposes with provision of non-food items (NFI) to the flood affected population.

- Community based housing and settlement protection mechanisms must be established to reduce flood risk, support internal capacities and promote peaceful co-existence.

- Public awareness component should be invested to reduce flood risk and mobilize the community around safe settlements.

- Existing land use regulations should be activated to protect the river and the population

Health and Nutrition

Sector Impact

- Critical healthcare facilities were flooded or cutoff from majority of the care seekers, compromising the capacity of emergency and essential health-care services.

- Flood created logistical challenges made impossible to get essential medical and nutrition supplies to the flood affected people in Beledweyne during crisis, compromising emergency responding institutions, agencies and private health services capacity and quality of services.

- Acute malnutrition increased putting at risk more children, pregnant women and elderly persons in the flood-affected areas.

- Some essential medical and Psychological health needs such as immunization did not get the priority attention of health workers for flood displaced and at-risk population.

- Due to the increased demand there was inadequate response of Health outreach services, dissemination of critical health information and community health education and sensitization.

- Due to the increased demand there was a shortage of emergency supplies consisting of cholera modules and trauma kits, malaria drugs, mosquito nets and more supplies limited by transport constraints.

Sector Recovery Needs

- Health and nutrition of the people in the flood affected areas must be given a top priority to prevent avoidable mortality and morbidity due to flood driven environmental health hazards and displacement through access to health care and preventative measures.

- Public and private health institutions' capacity of emergency and essential health-care services must be improved and coordinated to be able to effectively respond in flood emergency. Such capacity improvement measures should include infrastructure and equipment support, training, ability to deploy more health professionals with especial focus at short notice to provide case management, reproductive health care, immunization and psychosocial support to the displaced and affected population.

- Strengthen and scale-up of early warning, disease surveillance and case management capacity; including deploying rapid response teams for outbreak investigation and threat detection for disease control actions, to mitigate flood driven diseases such as Acute Water Diarrhoea (AWD) and cholera.

- Proper planning and stocking of emergency medical and nutrition supplies at the district level.

- Establishing public health awareness and health outreach services to save lives and improve health emergency response in Beledweyne.

Education

Sector Impact

- 33,701 school children in 104 schools affected by floods in Beledweyne, Berdale, Hudur, Marka and districts in Gedo[1].
- Flood-related damages include buildings, teaching materials including textbooks, classrooms, toilet facilities and drinking water facilities.
- Districts schools were closed even after the flooding in October 2019, keeping all school age children out of school and without or minimum recreational activities.
- Most of already scarce resources are directed to flood emergency response meaning less resource to education and rehabilitation of flood-affected schools.

Sector Recovery Needs

- The education recovery plan and funding are required to reach and respond the needs of the flood-damaged schools and school children in Beledweyne.
- Quick response plans to assess and rehabilitate damaged schools and recreational facilities, replace educational materials where they have been damaged, support hygiene promotion in schools and distribute aqua tabs to schools as needed.
- Establish child friendly spaces for children displaced by the flood and ensure teachers are equipped to provide psychosocial support to the children, facilitate recreational activities and refer school children to specialized child protection services as needed.
- Strengthen education sector response coordination and preparedness capacity of government, humanitarian agencies and communities in emergency preparedness and response.

1. United Nations Office for the Coordination of Humanitarian Affairs (OCHA), November 2019, Flood Response Plan

Environment

Sector Impact

- Improper waste management and lack of environmental awareness was observed during assessment.
- High level of river water contamination due to the dumping of waster both plastics, non-plastic and chemical waste into the river.

Sector Recovery Needs

- Proper awareness raising and education is required on waste management in order to improve waste management in Beledweyne
- To promote new and practical affordable models to waste management including latrines and waste disposal blueprints that are culturally and environmentally acceptable to the local communities.
- Proper waste management mechanisms to be put in place including proper sewage systems, allocating landfill disposal sites

3.2 Productive Sector

Agriculture and Irrigation

Sector Impact

- The 2019 flooding substantially damages the agriculture sector and estimates are higher than anticipated.
- Sector most affected the recent floods on Hiraan region is minus 37 percent reduced harvest. Beledweyn district still suffered a large net loss, mainly from reduced harvest of onions and tomatoes that trumped the modest gains in its main staple food production[1].
- On the positive impact agricultural experts generally believe that there were significant positive changes for most if not all cultivated areas resulting from the above- average Deyr rains, the higher river levels and from enhanced availability of flood recession irrigation in both irrigated and rain-fed crop production (pasture and agriculture crops).
- Damages to the irrigation and flood control infrastructure, such as new segments of breached embankments that were possibly caused by the recent floods.
- As of the time of this writing, however, there is no available, reliable information from the government, SWALIM or other agencies about the total sector damage or impact and needs for rebuilding.

Sector Recovery Needs

- The actual total recovery need for the agriculture and irrigation sectors in Beledweyne district is still work in progress. The following needs have been considered in the recovery plan of the sector:
  - Supply of agriculture inputs and fishery inputs in the short term;
  - Replacement of agriculture inputs and tools for storage purpose and pump

1. World Bank, 2019, Floods Impact and Needs Assessment, p35

sets for irrigation purpose considered as short-term needs;

- Some reconstruction activities such as market sheds, small irrigation projects etc. that are needed urgently should be addressed this year as medium term; and,

- Reconstruction of damaged assets should be addressed in the next two years as long term.

- Institutions and human capacity building Rehabilitation of pre-war flood control mechanism and systems, drainage and irrigation infrastructures

↘ The government to adopt new approach to drought and flood resilience, in the context of the expected higher frequency and severity of future cycles of droughts and floods, resilience building and sustainable solutions requires a rapid and tangible start towards better irrigation, drainage and flood-control, on-farm and communal storage, farm-to-market access, agricultural inputs and widespread adoption of Climate Smart Agriculture (CSA) practices and drought and pest-resistant seeds.

↘ Improved access to and adoption of productivity-enhancing and resilient technologies (CSA) practices for SMART cultivation and more modern post-harvest storage techniques and facilities.

Livestock

Sector Impact

↘ The details of direct damage and indirect loss of livestock are not yet available and this assessment works under the assumption that farm and livestock are almost two separate sectors by tradition, and there are few agro-pastoralist households in the district. Therefore, it is most unlikely that pastoral herds suffered any damage (loss of animals) from the floods.

Sector Recovery Needs

- There are no actual total recovery needs for the livestock sector in Beledweyne district; this is still work in progress. Livestock sector recovery efforts will be undertaken in the next two years. The sector has identified the following activities as priorities. Proposed medium-term solutions activities include:
  - Medicine supply and vaccines;
  - Animal health camp;
  - Mass vaccination for communicable diseases;
  - Vaccine supply, stockpiling of logistics.
- Long term solutions include:
  - Support for construction of improved sheds (flood resistant design);
  - Rehabilitation and promotion of the affected subsistence agro-pastoralist based farming;
  - Rehabilitation of commercial livestock industry;
  - Packaged programmes to revive livestock businesses;
  - Contingency plan for disaster management for relief and rescue in the livestock sector.

3.3 Infrastructure Sector

Transport

Sector Impact

- Major damages on road infrastructure have been confirmed in such forms as: washed away road sections, erosion on road shoulder and lanes, washed away surface and sub-surface pavement materials, clogging and erosion of drainage, and roadblock- age by debris.
- Road structures were also heavily impacted; including washed away bridges and approaches; damaged or clogged culverts, drifts and inverts; washed away or damaged ancillary infrastructure, such as guardrails, fences, signs, streetlights, and traffic lights. Roads that connect towns and villages in this region have been severely damaged due to the heavy rain, inundation, and the flow of water and debris.
- 50 percent of total road network in Beledweyne district has been affected. Exposure to high velocity floodwater and inundation caused the damage to roads, water flowed over the road causing severe and long-term damage.
- Beledweyne airport runway was partially flooded stopping emergency flights and the only major transport available to and from Beledweyne.
- The poor roads and/or inaccessibility as a result of damages to the road network would thus have a negative impact both economically and socially[1].

Sector Recovery Needs

- To restore accessibility to flood-affected areas by re- constructing and rehabilitating roads damaged to allow for social-economic recovery of the communities. This rehabilitation will need to follow a "building back better" concept in order to build resilience to future climate shocks.
- Recovery needs for the transport sector are not limited to damaged infrastructure but there may be include recovery needs for the airport and for the transport

1. Source: World Bank 2019 Floods Impact and Needs Assessment, p75.

operators who have lost business due to the flooding.

- Transport sector objective of the recovery strategy is to make all roads functional at the earliest possible. Immediate maintenance of partially damaged roads and bridges must be done within the first six months.

- Transport sector recovery and rebuilding plan must put in place with immediate implementation.

- It is necessary that certain risk reduction measures are included while undertaking repairs and reconstruction. These measures may include improvement of drainage of water and reduction of the level of submergence.

Water, Sanitation and Hygiene (WASH)

Sector Impact

- Shabelle River at Beledweyne station overflow created. 5 river overflow points and 4 potential flooding points. Also, flash floods as a result of heavy rains and water from the upstream in Ethiopia, last year injected huge amount of water to the city. The entire population of the district was impacted and almost half of the population was displaced. The flood caused a number of deaths and casualties and the sectorial damages and loss is great but not yet translated into numbers.

- Flood emergency was created shortage of safe water, emergency sanitation and hygiene emergency. Access to safe water supplies is still problem in Beledweyne since October 2019 flooding.

- The existing water supply system were damaged or contaminated by waste and sewages.

- Institutional role was diminished due to the poor level of response to the flooding, thus increasing the lack of trust to government institutions. This makes government institutions less effective in this sector and there is a need to improve the government role during disaster recovery.

Sector Recovery Needs

- Government to take a leadership role and to establish WASH National Strategic Priority Plan directed to improve water services, hygiene promotion and emergency sanitation toots and awareness. The plan should incorporate sector disaster prevention, preparedness and response mechanisms.
- Restoration and Rebuilding Action Plan must be created and implemented to restore river breakage points, manage and redirect flash flood streams and rebuild damaged sanitation facilities including sewages, wastewater management, drainages and waste disposals.
- Creating public awareness around WASH and more specifically river protection as a critical infrastructure and reaching out to the wider district population including basin farming community and villages in the district zone. It is very important to create awareness around waste management, water treatment/safe water storage, sanitation and hygiene to prevent health epidemics including Cholera outbreaks that is very common in Beledweyne area.
- Government institutions should take more seriously the responsibility to respond during flood emergencies with safe water, emergency sanitation and emergency hygiene kits and hygiene promotion.

Energy

Sector Impact

- Beledweyne city electricity is totally own and operated by private companies. The 2019 flood caused widespread breakdown of communications and electricity infrastructure in the area, as some substations were submerged in water.
- This assessment shows that 38 percent urban households had no access to electricity even before the flood. However, Loss of access to electricity has had a severe impact on people's ability to conduct their livelihoods and generate income, especially on households engaged in small and medium scale enterprises.
- With 62 percent access, the absence of electricity also had a negative impact on families who use it for productive activities and household work.

Sector Recovery Needs

- There is a need to improve access to electricity and government should engage plans and activities to make basic electricity accessible to all residents. The following initiatives for recovery have been prioritized:

  - Rehabilitation and improvement support both technical and financial to be provided to the electricity companies for the repair, maintenance and quick restoration of power and at the sometime to improve access.
  - To provide flood related information in order improve power stations and sub-station design consideration of flood level data.
  - Promote renewable and affordable source of electricity including solar and wind power to improve the level of access to cover the basic needs of electricity.
  - Promote other sources of energy for both lighting and cooking to preserve environment and save trees from the local consumption of charcoal and for lighting.
  - Device urban and rural energy policy towards improving access to electricity and improving livelihoods.

3.4 Economic Development

The total damage caused by the floods is unknown and there are no available estimated of how much that amounts to the GDP. The household sector accounts for the largest share of damages as many homes and standing crops were damaged. Income losses were not significant, and much of the costs were incurred by private housing stock. This will, therefore, have a low level of direct impact on the annual output of the national economy. The National Development Plan (NDP9) 2020 – 2024 already focused recovery from a long period of absence of formal economy due to the fragile state of the nation and its economy makes the fiscal burden placed by the recovery programmes unmanageable. However, it is expected the government's regular investments will fund the social and public components of the recovery, resulting in repairing river breakages, improving some level of infrastructure and housing for the city to be more resilient to future floods.

The floods will, however, have a larger impact on the local economy as a result of extensive damage to rural infrastructure in the district. If not supported through recovery and reconstruction, the frequent occurrence of floods will increase disparity at the regional and national levels. The difference in income and access to basic services will widen between people living in flood-prone area and other parts of the country. At the national level there is an evidence to support that some of the affected districts including Beledweyne are already among those scoring the lowest on the Human Development Index (HDI).

In Somalia, the percentage of population living below the poverty line is getting higher due to the increased frequency of climate shocks affecting. The economy in this district is much less diversified, and more than 70 percent of the people depend on farming. A slow rate of growth in the agriculture sector has not helped people rise above the poverty level, fueling an epic scale of temporary outmigration over the past decade. At the household level, food insecurity and poor nutrition are major concerns. Damage to houses and destruction of standing crops will pose serious problems for these households.

> The difference in income and access to basic services will widen between people living in flood-prone area and other parts of the country

4 Approach to Sustainable Solutions

4.1 Sustainable Solutions Strategy

The October 2019 floods in the Beledweyne affected about 231,000 people. Beledweyne town virtually submerged under floodwaters, instability, amid widespread poverty. In addition, the flooding caused significant damage to infrastructure, property, crops, livestock, and delayed planting, including increased risk of malnutrition and water/ mosquito-borne diseases as the water slowly recedes. While the flood-affected families are gradually returning to their land and homes, they are in need of recovery support to resume livelihoods and income to meet their family needs. These communities are mostly dependent upon agriculture and small business activities, and their income levels are generally low. As floods have severely affected these sectors, the impact on income, consumption and other indicators of well-being are high. The recent floods have exacerbated pre-crisis vulnerabilities of the district already impacted by major floods in 2016 and had yet to fully recover.

The post-flood recovery and reconstruction strategy creates opportunities to reduce flood risk, remove vulnerability and creating development towards sustainable solutions. Such programming aims to reduce poverty as a barrier, introduce flood-proof infrastructures during rebuilding and enabling conditions for sustainable development. The Sustainable Solutions Strategy also creates some challenges as well for development projects in making sure that post-flood recovery and rebuilding do not contribute to future flood risks. Therefore, to advance social and economic recovery through this strategy requires government leadership and the highest level of coordination between the Government of Somalia and International Development Partners. Creating close working relationships with decision makers, those who exercise leadership and demonstrate commitment is important for successful recovery and rebuilding efforts and within Durable Solutions and Resilience Framework. Since, the Federal Government of Somalia, regional administrations and local authorities have the primary responsibility and they need to be supported to be able to play a leadership and coordinating role at the local level. It is essential to strengthen their capacity and to support the implementation of the human development and economic growth pillars under the National Development Plan (NDP9)[4].

It is necessary to clarify and reaffirm the essential responsibilities of government during recovery and rebuilding process in the area of social and development policy making. In this process it is important to clarifying and maintaining the essential role of the government at the federal level, state and other public bodies. First, the government acts as guarantor of human rights

4 National Development Plan 2020-2024, NDP9 Pillars p104

231,000

Number of people affected by floods in October 2019

and participatory of democracy. Second, the government restores a sufficient degree of equity in the distribution of wealth through mechanisms of solidarity such as redistributive taxation and social security. Right to protection and development is an actual social security claim and indeed, one of the most powerful institutional expressions of social solidarity. The Sustainable Solutions Strategy must therefore aim to strengthening of sustainable social security systems through rebuilding and promoting durable and sustainable solutions to disaster preparedness and management. Third, the State acts to protect vulnerable groups at risk. Social protection systems therefore provide not only social security, which is designed to protect all members of society against life's risks, but also social services for all and social assistance for those in particular needs.

This strategy acknowledges the success of the plan hugely depends on improved institutional capacity efficiency built around the programming. Therefore, the strategy strongly recommends that government structures and institutions at federal, regional, district and community level are strengthened and are enabled to take responsibility for managing and driving through the changes required to recovery and rebuilding a more resilient community in Beledweyne. It is also important to identify local strategic partners and recognize identify their role in the recovery and rebuilding stage. Getting local strategic partners on board and defining, and informing their role is an important step to developing and implementing solutions programming.

4.1.1 Early Solutions

The 2020 Gu' rains are predicted for April – June with potential flood risks in Beledweyne, Hirshabelle among other areas in the country. In order to mitigate this upcoming disaster, the following early solutions must be implemented at Heli-Kilyo and Warboole Canal to minimize or prevent the impact of the predicted floods:

1. **Flood Water Diversion:** Utilization of sandbags and Hesco Barriers to prevent flooding and divert the water into the river

2. **Desilting the River:** Removal of sand accumulation and waste from the riverbed and trees and rubbish from the riverbanks to expand the water flow space and preventing breakages resulting from the pressure of the river.

3. **Sand Block Removal:** There is a need to remove the sand blocks from the sluice gates at Waraboole Canal to ensure that they can be opened to allow the flow of water into the canal thus preventing the floods.

4. **Emergency Riverbank Breakage:** Rehabilitation of the Gamberlaawe riverbank breakage to prevent the village from being flooded

5. **Flood Defenses:** Deploy sandbags and Hesco barriers to defend the town against the floods and protect infrastructure and assets.

6. **Multi-Hazard Early Warning Systems:** Completion of the already installed weather forecasting station and establishment of a multi-hazard early warning systems that can be coordinated and collaborated at all levels. Engage in policy dialogue and coordination with Ethiopia on the flood risk management with regards to the floods from the upstream in Ethiopia

7. **Raising Public Awareness:** Public awareness and civic education component should be invested to reduce flood risk and mobilize the community around critical and cross sectorial issues such as; flood

early warnings, safe settlements, health and environment, waste management, water treatment/safe water storage, sanitation and hygiene.

8. **Social Cohesion:** Enhancement of collaboration and cooperation of the local population with each other is requirement for long-term growth and prosperity.

4.1.2 Long-term Solutions

Prioritization of the Social, Productive and Infrastructure needs for addressing long-term solutions in Beledweyne needs to be undertaken and the following recommendations can be implemented to prevent further recurrent flood disasters in the district:

1. **Repairing the River Breaking Points:** Repairing the river breaking points are vital to life saving measures. These river breaking points were already identified categorized as; flood originated breaking points that are still open a total of 15 river overflow points, a total of 5 and potential for flooding points a total of 4.

2. **Rehabilitation of Existing Waraboole Canal:** The complete rehabilitation and soil removal of Waraboole canal, which has seven floodgates that were manually operated that would allow excess water from the river during high flow seasons to flood an area of about 12 km square before it flows back into the river. These gates are dilapidated, as they have not had any repairs, replacements or maintenance for decades.

3. **Building New Canal at Hilo-Kilyo:** Managing flash floods by building a new canal connecting from Hilo-Kilyo riverside to Guufaale, which is 62,250m (6.25km). This new canal will channel flash flood water sources all together from Hilo-Kilyo 7km North end of the city and will join to inject water to the river at Guufaale point Southside of the city. The proposed new canal also included new gates to control the water entering the canal and open or close up during river overflow. Annex 1 contains the full proposal with drawings of the flash flood management plan.

4. **Protection of Vital Lifeline Facilities:** Devising and adopting new measures to reconstruct and protect critical facilities such as water and electricity supply, roads and telecommunications, hospitals and sewage systems, have to be repaired quickly, even if the repair is provisional. Restoring education and health systems, rebuilding damaged homes, restoring contaminated water sources and providing psychological care through counseling should be given top priority.

5. **Improving Shelter Quality:** Assistance in kind could take form of roofing materials, building and improving water protection walls and investing innovation and technology to help improve shelter quality to be much durable and resistant to floods.

6. **Agriculture Inputs:** Construction of water reservoirs to make use of excess water for irrigation purposes and supply of agriculture inputs and fishery inputs in the short term, replacement of agriculture inputs and tools for storage purpose and pump sets for irrigation purpose considered as short-term needs and the Reconstruction of damaged assets should be addressed in the next two years as long term.

7. **Enable Rapid and Strategic Recovery towards Sustainable Solutions:** Strategic response requires government leadership and proactive planning. It also requires coordination of all stakeholders to work closely in all stages of disaster

management, post-disaster recovery and towards facilitating resilient recovery and sustainable development, while at the same time organizing, enabling and empowering local communities. Building on the past experiences, the government will develop standard and transparent method of delivering sustainable solutions, which would be helpful to the affected population and the local economy.

8. **Re-establishing River Management Authority:** Long-term plan requires special institutional arrangement such as National River Management Authority, a central agency to manage the river water for flood protection, water reservations, basin repair and, excess soil removal from the bottom, general maintenance work and water use. The agency existed before the civil war and the collapse of the central government in Somalia. Therefore, reestablishing the agency with a federal mandate is a very realistic and a step in the right direction.

9. **Promoting Local Economy Diversification:** Encouraging local economy diversification through non-farming activities would reduce local economy dependence on agriculture thus creating security in economy and consumption. A component of the recovery programme needs to focus on supporting the affected population for non-farm activities and related skill building programmes, this will pay off in the long run development aspect and will reducing unemployment.

10. **Improving Housing and Energy Conditions:** Improved housing quality through standard control measures and making electricity more accessible to all will have a great positive impact by creating resilience urban settlement in Beledweyne. The commonly used construction materials for walls, roofing and flooring are of low quality, endangering during flood disasters. Local government will need to put standards and measures to enhance the housing quality of the city to be safe for all, without increasing construction material prices.

11. **Protecting the Environment:** There are serious environmental losses, particularly the river water contamination, damage to the local forest cover. Waste management was identified as area that needs immediate intervention to protect the river and to improve health situation of the population. Environmentally sound waste management and waste disposal mechanism has to be introduced to the local community. Also, local government needs to lead the sanitation and waste management efforts in the district.

12. **Setting up Durable Solutions Programme:** A well-organized durable solutions programme is a public policy initiative on different scales. A systematic policy addressing the most urgent recovery needs in Beledweyne, based on the assessment of damages and losses, should be laid down, and financial allocations will be made for its implementation.

13. **Allocation of Water Supply System:** Drilling of twelve new boreholes outside the town of Beledweyne and connection of clean piped water inside the town.

14. **Water Reservoirs:** Build water reservoirs to catch flood water to be used later for irrigation, livestock consumption and to return back to the river when the water levels reduce.

15. **Reconstruction of Beledweyne local airport** to ensure that humanitarian and emergency flights are able to access the airport during flood disasters.

It is important to go beyond government recovery efforts and invite other stakeholders in the process, this will not be an exclusively government programme. The government

will invite other stakeholders to join the long-term solution-seeking programme. A collective rebuilding effort pools more expertise and financial resources, and addresses risk and vulnerability in a more comprehensive way. The rebuilding programme will also involve local stakeholders such as remittance companies, telecommunications, banks, cooperatives and business groups. Greater participation of the affected people in the rebuilding programme would be welcome. It would improve the design of the programme, bring more innovation and develop more solutions. The recovery programme will be implemented effectively in an open, accountable and transparent manner. Major decisions taken with respect to flood sustainable solutions will be widely disseminated through public media and other relevant channels as feasible.

4.1.3 Implementing the Solutions Strategy

Beledweyne Sustainable Solutions Strategy is a pilot intervention one programming model addressing the needs of Beledweyne, since the district was the most flood-affected area in the country in October 2019. Specific solutions plans for each of the other flood-affected districts will be produced and put into implementation replicating and scaling up the Beledweyne pilot. The Sustainable Solutions Programme in the Beledweyne district will be implemented as an umbrella programme with several components by the respective line ministries through the respective local governments. However, reducing river flood risk require a special institutional arrangement such as the National River Management Authority (NRMA) a dedicated unit or agency, with a federal mandate and within the federal structure, will be needed for leadership, coordination and monitoring of progress.

The National River Management Authority will take the lead of the overall reconstruction implementation, as the capacity of the local government could be expanded through deployment of additional technical experts who may be hired from the market for a time-bound period. While federal and local line ministries, departments and agencies focus on sectorial needs respectively within their mandates.

Beledweyne sustainable solutions programme though the Federal Government of Somalia has taken a decision so far to seek external assistance for flood solutions, it remains open to receiving assistance for solutions through interested development partners. The experiences and lessons of the previous floods response and recovery programme should inform the flood recovery programme. The Ministry of Planning will prepare a database of the recovery programmes and beneficiaries, and the programme can be evaluated on a concurrent basis to assess the impact on the affected people. The programme can collect information on how it has helped people recover from the impact of floods.

The programme is to be funded through different windows, which would be tracked and made public. One of the ways in which the government will make resources available for solutions is to provide allocations through its regular development programmes. Linkages with these programmes make it easier to allocate resources and implement the programme on the ground. While the government is the principal supporter of the solutions programme, it must be noted that programme beneficiaries also contribute to their own durable solutions. In fact, their contribution always exceeds government assistance. The beneficiaries are never passive recipients, and the government essentially ought to play the role of catalyst. In this case, Beledweyne Flood Committee are custodians of USD 530,000 from donations for the flood

risk management in 2019. The committee has been engaged as part of the program to start working on immediate solutions to mitigate floods predicted in April – May 2020. Several recommendations and support have been provided including the proposed rehabilitation of Waraboole canal, removal of waste and mud from the water relief designated areas of the canal and the building of a new canal at Heli-Kilyo.

4.2 Financing Framework

The National Development Plan disaster preparedness and management guide states that donor resources will be more effective if channeled through government. Humanitarian agencies along with international donors have been the dominant providers of Disaster Response, Preparedness planning and risk management in Somalia for more than a decade. The 2019/20 Mutual Accountability Framework (MAF) endorsed at the Somali Partnership Forum (SPF) help in Mogadishu in October 2019 was agreed on a plan to gradually increase the use of country systems by April 2020, and increase on-budget reporting of programme support to government entities and support for embedded Government advisers in the 2021 budget. The MAF agreed social and economic development principles clearly identifies a limited set of commitments for both government and international partners. Therefore, sustainable solutions priorities in this report are aligned with the some of the already agreed MAF themes that include the water recourses strategic plan, economic reform priorities, improving infrastructure services, environment and climate change, resilience and durable solutions[5].

The assessment findings identified key priorities to direct both government and international partners resources address sustainable solutions of the flood-affected communities in Beledweyne. In line with the broad principles of the NDP9 and MAF the aim is to invest in the recovery and to promote building resilience, durable solutions and to build back better practices. The government will be able to expand priority areas to cover more sustainable solutions activities once the emergency response and high priority interventions are accomplished. Successful compilation indicators will be assigned weight, reflecting their alignment with each of the four NDP9 pillars and MAF strategic objectives and principles. The prioritization results will be applied to draw conclusions on the success level of each of the interventions through a stakeholder driven process involving FGS, local state government, district authority, business and community representatives.

Initial funding of priority solutions interventions will be initiated by government or by more focused donors in collaboration with the government. Some of the shortfalls identified will be met by large-scale programs addressing national priorities that will be carried forward by government with international partner support, through the existing financing frameworks.

However, future-financing requirements for solutions will exceed available government and Official Development Assistance (ODA) funding. Therefore, in line with reviews concerning Sustainable Development Goal (SDG) financing, alternate sources of financing for investment requirements and opportunities will need to be explored to realize the sustainable development strategic objectives. This means continuing to reach out to traditional donors and engaging non-tradition ones such as the business community and Somalia diaspora leveraging the Durable Solutions approach to highlight government-led bottom-up and evidence-based rationale to inform and advance funding for solutions to displacement.

5 The Federal Government of Somalia, 2019, 2020 Mutual Accountability Framework (MAF) for Somalia

The recent floods have exacerbated pre-crisis vulnerabilities of the district already impacted by major floods in 2016 and had yet to fully recover

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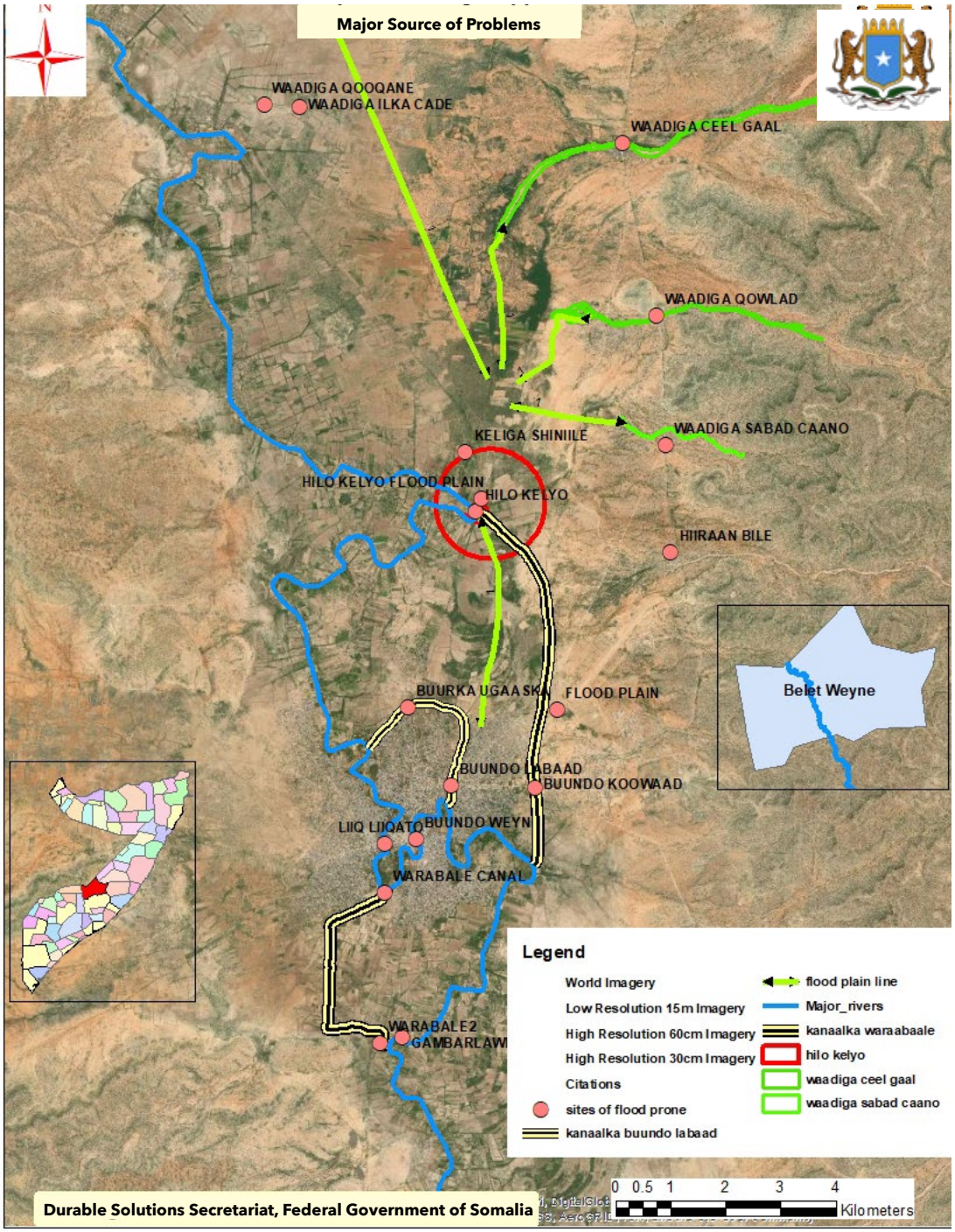
6 Annex

Annex 1: Map of the Major Source of the Floods



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