

# How well are we responding to Tanzania's growing flood hazards?



## At a glance

This bulletin explores the effectiveness of Tanzania's framework for protecting citizens against flood impacts by examining the case of Gulwe in Mpwapwa District in Dodoma Region. Like many parts of the country, Gulwe village regularly suffers from severe flooding after heavy rainfall. Well documented impacts include destruction of livelihoods, property and infrastructure of strategic importance to the national economy, imposition of food insecurity and water borne disease, homelessness and loss of human lives. Because of climate change, flood events in Tanzania are likely to become more frequent and more extreme<sup>1,2</sup>. Effective protection and response to flooding is therefore a vital aspect of sustaining economic growth and poverty reduction efforts. Despite millions of dollars of investment over many years into adapting to climate change, and the development of new laws, policies and strategy on disaster risk reduction we find that:

- ◆ Communities remain dangerously exposed to impacts of flooding despite the relative predictability of these events. Evidence shows that Gulwe has suffered over 10 flood disasters since 2011<sup>3</sup> and in 2014, flooding killed two people.
- ◆ According to the Ministry of Works, Transport and Communications, regular flooding in the Gulwe area has been a main factor in the dramatic reduction of freight traffic (by

some 90%) carried by Tanzania Railways Limited over the past decade.

- ◆ Mpwapwa District has had a District Emergency Preparedness and Response Plan since 2012, one of only 15 nationwide, developed under the Disaster Management Act 2015. However, to date there is no evidence of effective support to communities by government authorities in relation to flood disasters. Community members have twice written to statutory duty bearers in Mpwapwa District Council and the Wami-Ruvu Basin Water Board to request information and support for a more effective response to flood risks, but have received no response a year after writing. We ask whether this lack of response to legitimate concerns from vulnerable people is satisfactory?
- ◆ There is no process for linking the management of catchments, land-use and water resources, or measurement of weather events to effective flood protection, even in the worst affected areas. For example, although the Ministry of Water and Irrigation is stated to be the lead agency on flooding in the National Operating Guidelines for Disaster Management (2014) it is not clear who is assigned with responsibility for this work, or whether any budget is allocated. Coordination between authorities and agencies which could reduce risks and address causes of flooding appears to be weak.

Mpwapwa is not alone in terms of its exposure to flooding and the inadequacy of the response – our case studies in Dar es Salaam and Iringa reveal similar shortcomings in the approach to disaster preparedness and water resource management. This work shows that urgent measures are needed to make our communities water secure, and based on this evidence, we set out key questions for debate - and issues for action - at the end of this bulletin.

## Flood risk in Tanzania – what’s the story?

Flooding problems are on the rise because of changes in land-use and shifts in our weather patterns caused by climate change. Catastrophic levels of soil erosion in the headwaters of our rivers and poor solid waste management means that river channels are choked with sediment and rubbish, and flood much more quickly. 51% of Tanzania’s soil is being degraded because of deforestation, overgrazing and unsustainable farming methods, and soil erosion costs the country an estimated USD\$2 billion each year<sup>4</sup>. Poor land-use, planning and enforcement means construction within flood plains and exposes communities to extreme flood risk.

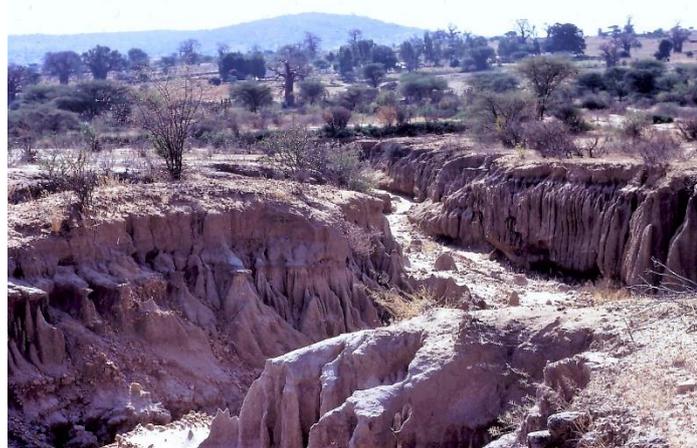


Plate 1. Near Dodoma: soil degradation contributes significantly to flood risk.

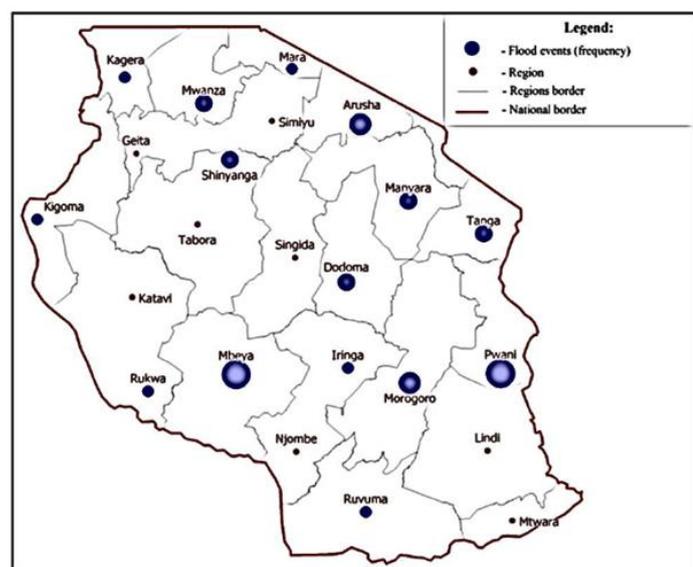


Figure 1. Frequency of flood events by region

The economic impacts of flooding nationally are huge. A study by the government and DFID shows that by 2030 climate related disasters like flooding could cost 2% of GDP annually, and prevent us from reaching our economic development goals<sup>5</sup>. The human impact of flooding is also huge, and can lead to national food

shortages (such as after the 1997/98 El Nino) and tragic events such as the deaths of 38 people in Shinyanga in 2015, and the now annual fatalities in Dar es Salaam.



Plate 2. Flood impacts, Dar es Salaam 2015

## Managing flood risk – who should be doing what?

The **Disaster Management Act 2015** provides sweeping powers and responsibilities for prevention and management of flood events. It establishes a comprehensive framework of powerful bodies including a **Tanzanian Disaster Management Agency, Council and Fund, Regional Disaster Management Committees** appointed by the Regional Administrative Secretaries, and **District Disaster Management Committees (DIDMAC)** appointed by the District Executive Directors, and provides for similar committees at Ward and Village level. These committees are responsible for advising on, overseeing and coordinating disaster management and emergency operations, and for mobilising resources for this. They have significant powers to ‘direct institutions, order evacuations, request support and to do any such thing which is necessary to prevent, mitigate, prepare for, respond and recover from disaster risks’ (s.5 – s.17 DMA 2015).

It is not clear if the Disaster Management Agency has been set up and it seems that currently the functions continue to be carried out by the **Disaster Management Department of the Prime Minister’s Office**.

The requirement for Disaster Management Committees is reflected in commitments under the **National Disaster Management Policy 2004**, the **Hyogo Framework for Action**, and the **Disaster Relief Coordination Act No 9 of 1990**. Under these provisions each District must develop a **District Emergency Preparedness and Response Plan (DEPRP)**. The Mpwapwa DEPRP<sup>6</sup> has been reviewed and key provisions summarised:

- a) It assigns responsibility to the **District Commissioner**, as chairperson for all disaster management issues in the District.
- b) It is the responsibility of the **District Council** to protect life and limb, or where the capacity of the district is exceeded assistance will be requested from higher authorities
- c) It should include mitigation – reduction of hazards, supported by vulnerability analysis which sets out how people, property and structures will be effected.

- d) It includes preparedness – monitoring of potential disaster risk factors, development and testing of contingency plans, sound analysis of risks and provision of early warning.
- e) It refers to the **National Operating Guidelines (NOGs) for Disaster Management (2014)** which establish the **Ministry of Water and Irrigation as the lead agency for dealing with flood hazards** (Annex B)<sup>7</sup>.
- f) It requires **annual review** and updating of the information in the plan, testing and revision, including after actual implementation.
- g) **Tanzania Meteorological Agency** will provide early warning to DIDMAC so that it will one of the first agencies to respond to early warnings and take appropriate action
- h) It sets out **Emergency Activation Levels 1,2, and 3** and requirements for communication and warning to efficiently alert and warn the general public on impending emergency situations including door to door operations.

Furthermore, the **Wami Ruvu Basin Water Board** has developed a catchment management plan for the Kinyasungwe River and scoped the need for a Water User Association in 2012. Both measures should assist in managing the catchment sustainably in ways which minimise the risks and impacts of flooding, however, it is not clear if either have been implemented.

## Gulwe Ward - What's happening?

Gulwe village is a useful case study because of its long history of catastrophic flood disasters with impact on local lives and the national economy. The village sits at the neck of a narrow valley

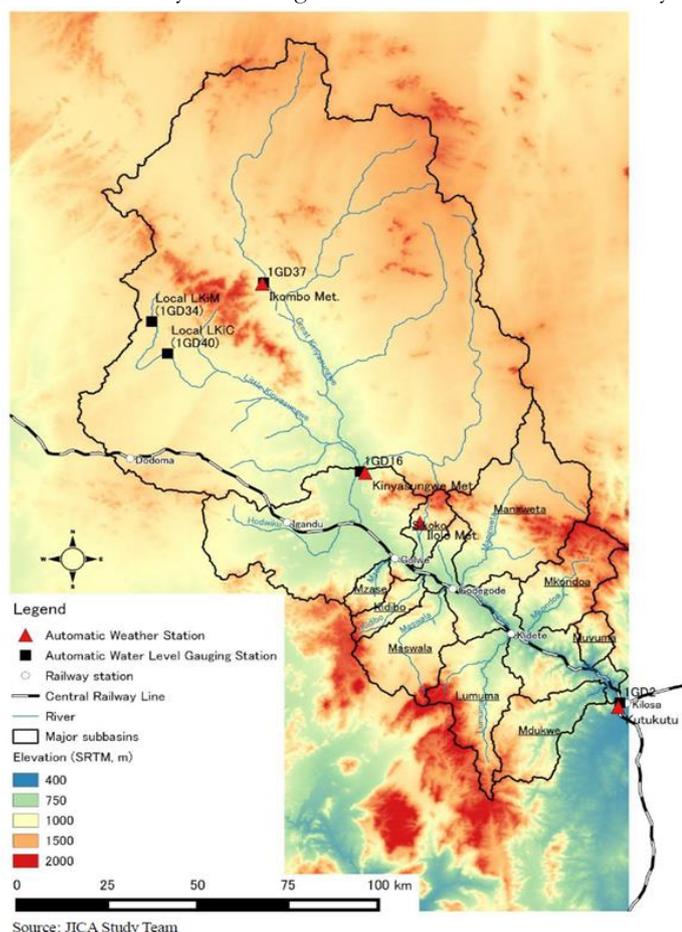


Figure 2. Location of Gulwe Village and Central Railway in Kinyasungwe sub-catchment. Hydromet stations upstream suggest that early warning is possible.

where the Kinyasungwe/Mkondoa River runs alongside the Central Railway and is joined by the Mzase River.

Mpwapwa is one of only fifteen districts where a District Emergency Preparedness and Response Plan (DEPRP) has been developed with the assistance of UNICEF. The National Disaster Vulnerability Analysis<sup>8</sup> report of 2003 identifies Mpwapwa as facing severe flood hazards, and the Mpwapwa DEPRP (2012) confirms floods are the main hazard affecting the greatest number of the District's population (305,056). Flooding is ranked as having high probability, with major impact on public health and infrastructure. Gulwe Ward of 10,385 people is reported to be particularly badly affected.

Given this notoriety, Tanzania's most flooded village should surely be the focus of effective and coordinated action? Our study brings evidence that this is far from the case. We pose the question that if Gulwe isn't protected – what chance has the rest of the country? Based on case study evidence we pose a series of questions and recommend for action at a local and national level to ensure action in the public interest to ensure an improved flood response for Tanzania's people and economy – for a fairer water future.

The case study at Mpwapwa has been investigated through site visits in April, June, August and November 2016, with 75 people met as well as local NGOs (Mamado and WaSeCoDe), District staff and meeting with Disaster Management Unit-PMO. Key findings include:

### 1. Regular and severe flooding imposes significant impacts on people, development and the economy

**1998:** El Nino rains and the failure of the Kidete Dam caused **catastrophic damage** to the central railway line between Gulwe and Kilosa

**2009:** Floods at Gulwe destroyed the Central Railway line and **closed rail services between Dar and Dodoma for 5 months**<sup>3</sup>.

**2010:** In Mpwapwa and Kongwa 19,000 people were affected by flooding and forced to leave their homes. In **Gulwe 4532 were affected and 500 households displaced**. Vast areas of land were flooded and Gulwe Bridge connecting 8 wards to Mpwapwa town was destroyed. There was **shortage of food in Mpwapwa and fuel prices doubled**. USD 2 Million was channelled to respond<sup>9</sup>



Plate 3. Gulwe Bridge destroyed by floods in 2010.

**2013:** Three boreholes used to supply water were washed away. Since then access to clean and safe water for domestic use has been a big challenge to communities. People are forced to depend on hand dug ponds and seasonal rivers. The problem gets worse during dry spells, and the population faces serious health risks because of unsafe water. According to health professionals, outbreak of water borne disease including diarrhea, malaria, bilharzia and stomach ache are common in the area. The only dispensary in Gulwe, is lacking the necessary facilities and qualified health specialists to meet the demand<sup>10</sup>.

**2014:** Severe flooding derailed a cargo train at Gulwe killing two and injuring seven people (see Plate on opening page). The magnitude of the destruction was huge according to the Director General of the Tanzania Railway Authority<sup>11</sup>.



Plate 4. Severe flood damage to the CRL at Gulwe.

**Community testimony of the flood impacts:**



*The people of Gulwe have been suffering from floods for more than 25 years but the impacts have been worse over the last three years with people losing their assets. Many have suffered from hunger and lost income because crops were destroyed by floods.*

**Gabriel M. Kazige, Ward Councillor- Gulwe.**

*Floods have washed away our boreholes, and now we only depend on open ponds and directly from the river, though the river water is not safe but we have no alternative. We use this water for all our domestic uses.*

**Community member- Gulwe**



*The community in Gulwe is regularly affected by flooding which destroys our crops and houses causing great suffering. We received a little support in terms of emergency food provision, but that is not enough to deal with the problem.*

**Mzee Adam, Mashahidi wa Maji Chairperson- Gulwe.**

**2016:** 75 houses were destroyed and Gulwe Primary school affected, forcing students to miss school for over 8 weeks. Electricity pylons were moved posing risks to people’s lives, especially children. More than 50 acres of crops were destroyed by floods leaving many families facing hunger, and the Government provided food aid as a temporary solution<sup>12</sup>.

**2016:** JICA study concludes that freight traffic carried by the TRL has declined substantially over the last decade and that the primary reasons for this include repeated flooding between Kilosa and Gulwe. Between 2011 and 2014 there were 40 flooding incidents along that stretch of line resulting in 33 days line closures<sup>3</sup>.

**2. Despite new laws and institutions, and millions of dollars invested, the needs of those facing flood risk on the ground have not been addressed.**

- 💧 The Disaster Management Act 2015 and policy of 2004 provides sweeping powers to government to shield vulnerable communities from disaster risk including floods. Under this law, mitigation and response plans, resources, trained staff, communication plans and early warning systems should be in place under the coordination of Regional and District Disaster Management Committees. Multiple donor initiatives have focused on supporting the country’s climate adaptation and disaster management response.
- 💧 When citizens of Gulwe affected by flooding wrote to duty bearers to request information about disaster management and support from them, they received no response.
- 💧 On the 26<sup>th</sup> August 2016 and the 9<sup>th</sup> November 2016, the community wrote formal letters to Mpwapwa District Council and the Wami-Ruvu Basin Water Board requesting action to mitigate flood impacts in line with statutory duties of these agencies under the DMA 2015, Water Resource Management Act 2009 and National Operating Guidelines 2012. They also requested collaboration to form Kinyasungwa Water Users Association and a Community Water Supply Organisation (COWSO) so that the community could play their role in mitigating flooding risk. It is not clear why no response has been received even though letters were written ten months ago.

*We have written letters to the responsible authorities but did not receive any feedback.*

**Gabriel M. Kazige, Ward Councillor- Gulwe**

*We have been reporting our issues to the authorities but not much has been done so far. We’d be happy to have proper assistance to solve our problems.*

**Mzee Adam, Mashahidi wa Maji Chairperson- Gulwe**

### 3. We are waiting for disasters to happen instead of taking action to prevent them: flood prevention and warning are not prioritised and co-ordination is weak.

Within the flood response seen in Gulwe and elsewhere, there is little evidence of steps to prevent flooding or to forewarn the people likely to be affected, despite this being a clear requirement of law and policy.

- According to official government reports, a major factor contributing to flooding is the very high sediment load caused by soil erosion because of expansion of unsustainable cultivation, deforestation and overgrazing in upstream tributaries<sup>3</sup>. However, no clear measures are set out to address these issues. In the same report, countermeasures planned are removed, cited as being ‘confidential’.
- The District Emergency Preparedness and Response Plan lacks any measures focused on prevention and risk reduction. It sets out Emergency Activation Levels 1,2, and 3 but fails to set out the triggers for these warnings in terms of flooding and water levels. Neither is anybody assigned the responsibility for flood management. Nor is there any detail on who faces risk and where, and who should be evacuated. Further, whilst it specifies the need for emergency public information and sets out a District Disaster communications strategy, no detail is provided of who will do what, and when.
- Roles and responsibilities on flooding are confused. Although the Ministry of Water is assigned as lead agency in the management and prevention of floods, it is not clear if any resources, funding or responsibility has been allocated for this work within the Ministry.
- Early warning of flooding doesn’t yet exist in Tanzania and this exacerbates risk. According to research in 2015<sup>13</sup> :  
*currently no comprehensive and effective hydrological prediction service exists for water bodies across the country. The lack of a unified database of flood and other disastrous hydrological phenomena leads to high level of uncertainty. Hydrological forecasting could be effectively used for early warnings and evacuation procedures. A system of flood forecasting and early warning to residents should be developed and implemented in the near future.*

*We merely wait until disaster has occurred and then act only on recovery. Disaster Management Units have inadequate budget and resources, and we invite disaster because of poor land use planning.*

**Masozi Nyirenda, Disaster Management Expert, Tanzania Education Authority (Reuters, May 2015)**

## What needs to change?

**Locally:** Urgent steps should be taken in Gulwe and in other areas facing acute risks from flooding, to minimise impacts on local people. We ask:

- a. Are the DIDIMAC, communities in Gulwe and Ward and Village Committees working together to make a full assessment of flood risk, and to plan effective mitigation and early warning strategies? What remediation measures have been taken to repair or replace water supply and sanitation infrastructure damaged during previous droughts, and to form of a COWSO to maintain the infrastructure.
- b. How does the DIDIMAC work with the Wami Ruvu Basin Water Board to ensure that the Kinyasungwe sub catchment management plan is implemented and a Water User Association formed? Are the resources and finance needed to ensure effective measures are taken to address the causes of flooding in the sub catchment (namely massive levels of soil erosion) available?
- c. Given the presence of automatic rain-gauges and water level recorders in the upper catchment, is there an early warning system to provide forewarning if flood events?

**Nationally:** The Gulwe case suggests that the system for managing floods and other disasters requires urgent attention to ensure that it is operationalised, and that citizens are better protected. We ask:

1. Are the Regional and District Disaster Management Committees operational and accountable? Do they possess the resources and personnel which will allow them to fulfil the important statutory duties assigned to them?
2. Do District Emergency Preparedness and Response plans contain enough detail, with clear lines of accountability and adequate financing, or do they exist as a paper exercise which gives a dangerous impression of resilience planning?
3. How well are duty bearers such as Disaster Management Committees, land-use planning agencies, TMA and Basin Water Boards collaborating and communicating to ensure that: a) land is used wisely and catchments are managed in ways which minimise flood risks, and that b) early warning systems are in place?
4. Are the Ministry of Water and Irrigation, and Basin Water Board’s roles in Disaster Management and response properly understood? Do they possess the knowledge, resources, and mandate to ensure that water resource management plays its proper role in underpinning climate adaptation and disaster resilience?
5. Funding requirements for climate resilience and adaptation in Tanzania have been calculated to be USD 650 million per annum<sup>5</sup>. How close are we to realising this level of investment?
6. If communities in places like Gulwe are yet to receive effective support in dealing with the impacts of climate, do we need to re-examine how well government and donor investment on the topic are being spent, and rethink our priorities?
7. Would it be useful to have a national database of water related incidents (disasters, conflicts, pollution problems) or national incident reporting system (NIRS) so that we can prioritise an effective and transparent response which targets limited resources towards solving the most pressing water security issues which affect the largest numbers of people?

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<sup>1</sup> TMA, 2015. Climate Change Projection for Tanzania. Tanzania Meteorological Agency (TMA), Ministry of Transport, United Republic of Tanzania. ISBN 978-9987-9981-0-5. pp.37.

<sup>2</sup> IPCC, 2014. Climate Change 2014 Synthesis Report Summary for Policymakers. pp.31.

<sup>3</sup> JICA 2016, Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania, Final Report Volume 1, Ministry of Works, Transport and Communications, Reli Assets Holding Company, United Republic of Tanzania.

<sup>4</sup> Kirui O. K. and Mirzabaev A., 2015. Costs of land degradation in Eastern Africa, Center for Development Research, University of Bonn.

<sup>5</sup> DFID/URT 2011, Economics of Climate Change in Tanzania, Paul Watkiss/GCAP

<sup>6</sup> Prime Minister's Office 2012. MPWAPWA DISTRICT DISTRICT EMERGENCY PREPAREDNESS AND RESPONSE PLAN (DEPRP)

<sup>7</sup> PMO-DMD, 2014. National Operational Guidelines for Disaster Management, 2<sup>nd</sup> Edition. URT with support from UNDAP

<sup>8</sup> PMO- DMD 2003, National Vulnerability Assessment with support from USAID.

<sup>9</sup> ICRC 2019, Tanzania Flood Appeal: Emergency appeal n°MDRTZ010

<sup>10</sup> Local testimony collected during field work, June 2016.

<sup>11</sup> IPP Media report <http://www.ippmedia.com/en/flooding-halts-train-services>

<sup>12</sup> Tanzania Today news report <http://www.tanzaniatoday.co.tz/news/mvua-yaacha-kaya-30-bila-makazi>

<sup>13</sup> Mikova K and Makupa E.E., 2015. Current status of hydrological forecast service in Tanzania, University of Dodoma [https://www.researchgate.net/publication/282858615\\_CURRENT\\_STATUS\\_OF\\_HYDROLOGICAL\\_FORECAST\\_SERVICE\\_IN\\_TANZANIA](https://www.researchgate.net/publication/282858615_CURRENT_STATUS_OF_HYDROLOGICAL_FORECAST_SERVICE_IN_TANZANIA) [accessed Jul 5, 2017].

**Plate on opening page:** Derailed cargo train in 2014 due to flooding, Gulwe, Mpwapwa.

**Plate 5.** A resident attempting to pass through a flood affected area.

