
IntoAction

4

2012 RISK Award

Making the city of Beira resilient to floods and cyclones

People-centered early warning
in the urban context

Edited by Christian Barthelt
and Thomas Loster

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**Munich Re
Foundation**
From Knowledge
to Action

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Overview – Beira project

Duration

August 2012 – March 2013

Continuation

The project was part of a national scheme initiated by the GIZ Mozambique and the National Institute of Disaster Management, INGC. The town of Beira was also directly involved. This ensures the continued and sustainable operation and expansion of the flood-warning system.

Project management

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About the RISK Award

Why is there a need for action?

The risks posed by population development, environmental and climate change are increasing. Complex technical systems and infrastructures are additional risk factors. The RISK Award partners recognise the need to address this development. We hold recent disasters, such as the floods across Germany (2013), Hurricane Sandy (2012), the earthquake and tsunami in Japan (2011), the earthquake in Haiti (January 2010), the floods in Pakistan (2012, 2010) and in Australia (January 2011), the heat wave and wildfires in Russia (2010), to be indicative of the increasing devastation and variety of disasters the world is facing today. The RISK Award has been set up to help improve risk reduction and disaster management by providing financial support to projects dedicated to this topic.

Guiding principles

We draw attention to the fact that risk and disasters threaten development and security. The resilience of people and communities must be improved and disaster risk management (DRM) must become a major global concern.

We underline the fact that the world's growing population combined with expanding urbanisation and the exposure of people and values to risk has aggravated the risk potential for communities and nations. Climate change is exacerbating the risk situation.

We believe that in order to support prevention, intervention and fast recovery from unexpected events, it is crucial to promote projects and programmes in the field of Risk Reduction and Disaster Management along the guidelines of the Hyogo Framework for Action strategy.

We know that a key is to be found in the communities themselves. Local knowledge and coping strategies must be included in prevention strategies. Gaps must be identified. Knowledge must be communicated and blue print examples of successful prevention must be multiplied and scaled up. In addition to this bottom-up approach, global strategies and frameworks such as the Hyogo Framework for Action are also needed (top-down).



The RISK Award is conferred in partnership with UNISDR and the GRF Davos. The photograph shows the presentation of the winning project "Beira" during the closing ceremony of the 4th Global Platform for Disaster Risk Reduction in Geneva in May 2013.

The RISK Award partners



UN International Strategy for Disaster Reduction (UNISDR)

ISDR is a strategic framework adopted by United Nations Member States in 2000 and is aimed at guiding and coordinating the efforts of a wide range of partners to substantially reduce disaster losses and build resilient nations and communities as a fundamental condition for sustainable development. UNISDR is the secretariat of the ISDR system. It comprises numerous organisations, states, intergovernmental and non-governmental organisations, financial institutions, technical bodies and civil societies working together and sharing information to reduce disaster risk.

Prize and awarding ceremonies

The RISK Award, endowed with up to €100,000 in prize money, is assigned to operational projects in the field of risk reduction and disaster risk management. The first prize was announced on 13 May 2011 at the 3rd Global Platform for Disaster Risk Reduction organised by UNISDR in Geneva. The prize was awarded on 26 August 2012 at the 4th International Disaster and Risk Conference (IDRC) organised by GRF in Davos.



Global Risk Forum Davos (GRF)

The GRF Davos Foundation aims to bridge the gaps between science, administration, the private sector, risk-management professionals and the public in regard to risk reduction, disaster management, and climate change mitigation and adaptation. GRF Davos is the organiser of the International Disaster and Risk Conference (IDRC). IDRC is a global gathering of experts on risk reduction, disaster management and climate change adaptation and is held as a biennial conference in Davos, Switzerland.



Munich Re Foundation (MRF)

The Munich Re Foundation is an independent, non-profit organisation founded by Munich Re in 2000. People are ultimately at the core of what the foundation's work is all about. The foundation's task is to prepare people for the risks they are exposed to and to minimise these risks wherever possible. It clarifies issues and provides support, also in developing countries. In dialogue with partners worldwide, Munich Re Foundation stimulates ideas and creates perspectives.



RISK Award 2012

“Early warning in urban areas”

Thirty-eight applications from all over the world

In view of the increasing settlement of exposed areas on a global scale, the first RISK Award focused on early warning in urban areas in keeping with the long-standing UNISDR campaign, “Making my city resilient”. A jury chose the winning proposal. There were 38 applications from countries and cities all over the world including Singapore, Accra (Ghana), Yerevan (Armenia), Manila (Philippines), Aquino (Haiti), Chennai (India), Teheran (Iran), Rio (Brazil) and Lagos (Nigeria). The topics covered in the various DRM proposals were moreover rich in variety and addressed a wide diversity of natural hazards and capacity building efforts.

The map shows the ten best project proposals for the 2012 RISK Award. They were selected by the international jury and received an honorary certificate. The project topics also reflect the diversity of the proposals submitted.



Members of the RISK Award jury



Walter Ammann

is the founder and president of GRF Davos, a foundation focused on risk reduction, disaster management, resilience increase, sustainable development and climate change, organiser of the biennial IDRC Conference in Davos and director of the GRF Risk Academy, an institution offering knowledge management, R&D and continuous education worldwide. He is also Permanent Visiting Professor at the Harbin Institute of Technology in Harbin, China.



David Cadman

is the president of ICLEI and a former Vancouver City councillor. David was the Vancouver City councillor for three terms. He was first elected in 2002 and re-elected in 2005 and 2008. He served for six years as a councillor with COPE, the Coalition of Progressive Electors. He has also served at national and international level in the United Nations Association and was awarded the United Nations Peace Medal and United Nations 50th Anniversary Medal.



Anisya Thomas Fritz

is a cofounder of the Fritz Institute where she served as Managing Director from its inception in 2001 until July 2007. During her tenure, Fritz Institute developed the award-winning Humanitarian Logistics Software (HLS) and its successor HELIOS, launched the sector-wide Certification in Humanitarian Logistics (CHL) and spearheaded the creation of the new partnership for African Red Cross and Red Crescent Societies (NEPARC).



Thomas R. Loster

a geographer, was a member of the GeoRisk Research Group at Munich Reinsurance Company, Munich, the world's leading reinsurance company, for 16 years. He was in charge of issues relating to weather perils, climate change and climate policy. Mr. Loster was appointed chairman of the Munich Re Foundation in July 2004. The foundation addresses major global challenges including environmental and climate change as well as disaster prevention.



Hon. Maria Emily Lubega Mutagamba (MP)

is the Minister of Tourism, Wildlife and Antiquities and the Woman Member of Parliament, Rakai District, Uganda. She is a Member of the UN Secretary General's Advisory Board on Water and Sanitation (UNSGAB). Formerly she was the President of the African Ministerial Council on Water (AMCOW 2005–2007), and the Minister of Water and Environment (2006–15th August 2012).



Professor Haresh Shah

has been a pioneer in the fields of risk analysis, earthquake engineering and probabilistic methods for over 35 years. He has served Stanford University in many capacities, among others as Chairman of the Department of Civil Engineering and Founding Director of the John A. Blume Earthquake Engineering Center. He is also a member of many editorial boards of professional journals and professional societies.



Margareta Wahlström

is the Special Representative of the Secretary-General for Disaster Risk Reduction. She has over 30 years of extensive international experience in humanitarian relief operations in disaster and conflict areas and in institution-building to strengthen national capacities for disaster preparedness. In November 2008, the United Nations Secretary-General Ban Ki-moon announced her appointment as the first Special Representative to the Secretary-General for Disaster Risk Reduction.

RISK Award goes to the city of Beira, Mozambique

The € 100,000 prize money went to the “Making the city of Beira resilient to floods and cyclones” project which had been proposed by IP Consult/ AMBERO and commissioned by the GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit) in cooperation with Mozambican administrative institutions.

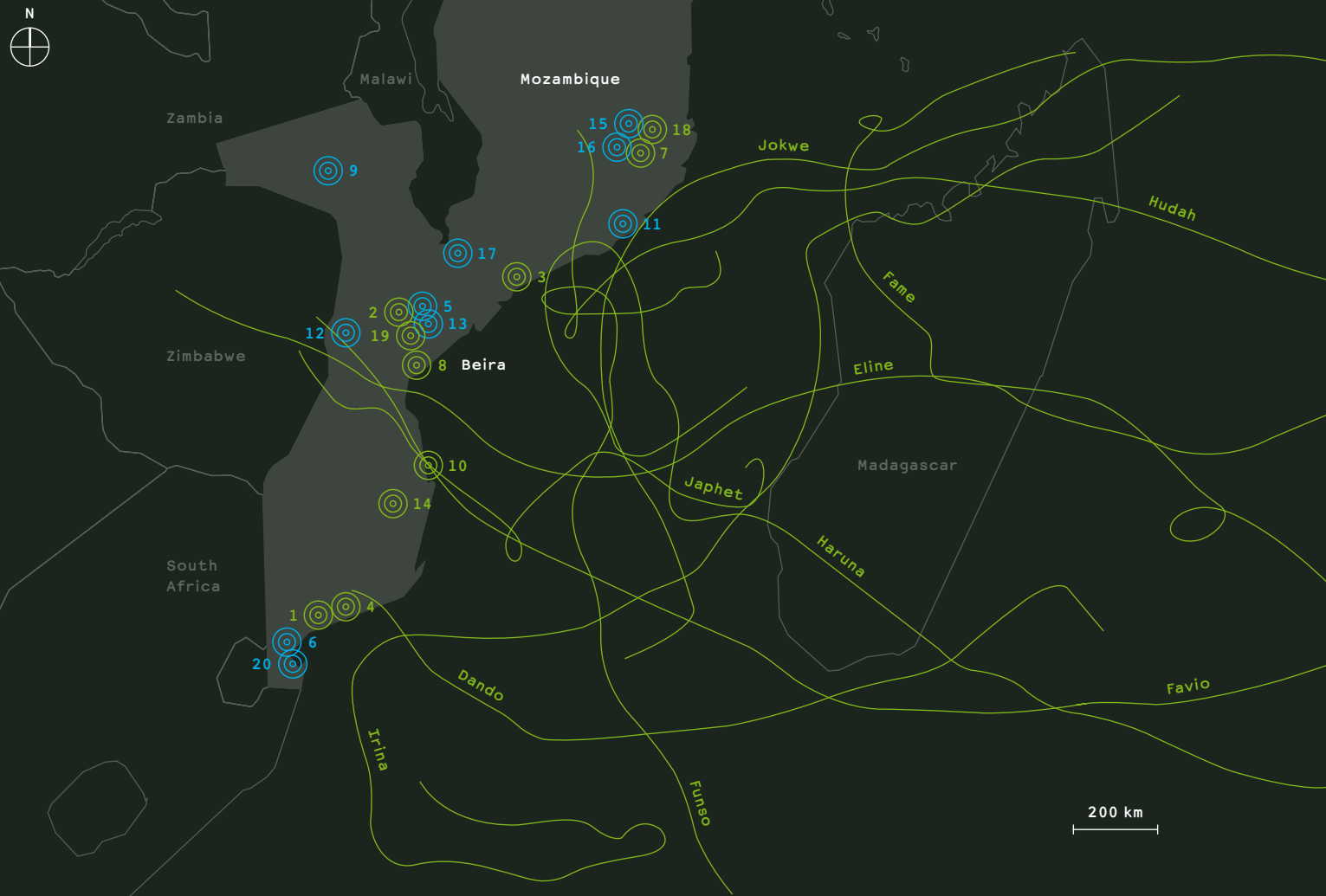
The seven members of the RISK Award jury fully agreed on the winning project. What distinguished the Beira project was its inherent simplicity, and the fact that it is easy to replicate. To improve early warning, especially at night, a simple flood warning system, based on digital contact sensors activated by the rising water level with instant data uplink between the sensor and the users, was developed using local materials and has been installed in critical locations. It resembles a snorkel and can easily be constructed and replicated. Hence its suitability for use in other urban areas around the globe.

One of the system’s key features is its inclusion of the people at risk from the very outset. In addition to this, the project is backed by Mozambique’s INGC, the National Institute for Disaster Management, which can provide useful input based on experience it has gained in cities such as Maputo. The project has such potential because it is tailored to the community and enjoys the support of the national authorities. In cities throughout Mozambique and other countries, people will be better prepared which will consequently promote development.

The certificate for the winning project in Beira. It was presented to the winners, IP Consult/ AMBERO and the GIZ and INGC partners, at the International Disaster and Risk Conference (IDRC) in Davos in August 2012.



Natural disasters in Mozambique 2000–2013*



Mozambique is hit regularly by natural disasters, flooding occurs on an almost annual basis. A total of 117 people lost their lives during major flooding in the spring of 2013, most of them in the Gaza province in the south of the country. The economic losses exceed US\$ 500m. The map shows the 20 most significant flood and storm events since the year 2000.

- ⊙ Meteorological events (Storm)
- ⊙ Hydrological events (Flood, mass movement)
- Cyclone

* Updated August 2013

Number	Date	Loss Event	Fatalities
1	February 2013	Cyclone Haruna	117
2	March 2012	Tropical Storm Irina, floods	8
3	January 2012	Cyclone Funso, floods	31
4	January 2012	Tropical Storm Dando, floods	9
5	December 2010–January 2011	Floods	12
6	January 2009	Floods	25
7	March 2008	Cyclone Jokwe	17
8	January–February 2008	Floods, cyclone Fame	20
9	November 2007–January 2008	Floods	50
10	February 2007	Cyclone Favio	10
11	January–February 2007	Floods	45
12	March 2006	Floods, flash floods	30
13	January–April 2004	Floods	0
14	March 2003	Tropical Cyclone Japhet, floods	11
15	February 2003	Floods	47
16	January 2003	Floods	7
17	January 2001	Floods	62
18	April 2000	Tropical Cyclone Hudah	3
19	February 2000	Tropical Cyclone Eline	17
20	February–March 2000	Floods	700

The city of Beira

Poor people developing greater resilience to floods

Beira is the second largest city in Mozambique with approximately 450,000 inhabitants.

It has been facing increasing environmental stress and natural hazards over the last decades. Population explosion, mainly due to immigration from rural areas, is one driving factor. In fact, the population has almost doubled since 1980.

New neighbourhoods have mainly been built in swamp areas close to or below sea level that had been covered with sand to create space for human settlements. The second factor causing problems is related to climate change. It has led to a rise in sea levels, thus affecting the city's groundwater level. In combination with heavier rainfalls – which can no longer be absorbed by the already saturated soil and storm water drainage systems – the number of floods has increased. At the same time, it is likely that more intense cyclones will hit the coast more frequently.

The photograph shows a typical situation in one of Beira's poor town quarters. The houses are built on the edge of a small undeveloped watercourse. Strong rains or storms forcing seawater into the canals can lead to major flooding.



The vulnerable poor suffer the most

Parts of the informal townships in Chaimite, Munhava, Matacuane, Macurungo, Chipangara and Chota are already located as much as up to ten metres below sea level. This is where some of the cities' most vulnerable and poorest inhabitants live. People living in these townships live under the constant threat of flooding, mostly during the rainy season and during cyclones when sea water enters the drainage ditches. The vulnerability of the population in these townships is particularly high due to the density of the dwellings, the lack of infrastructure and the generally depressed socio-economic conditions. Families are especially susceptible to floods occurring at night with little or no warning. Without an appropriate response strategy, the situation will get worse in the decades to come. Major areas of the central neighbourhoods could become uninhabitable within the next 20 years.

This hut in Chota, a slum district of Beira, is built close to a canal. It shows that the housing in this area is particularly vulnerable.

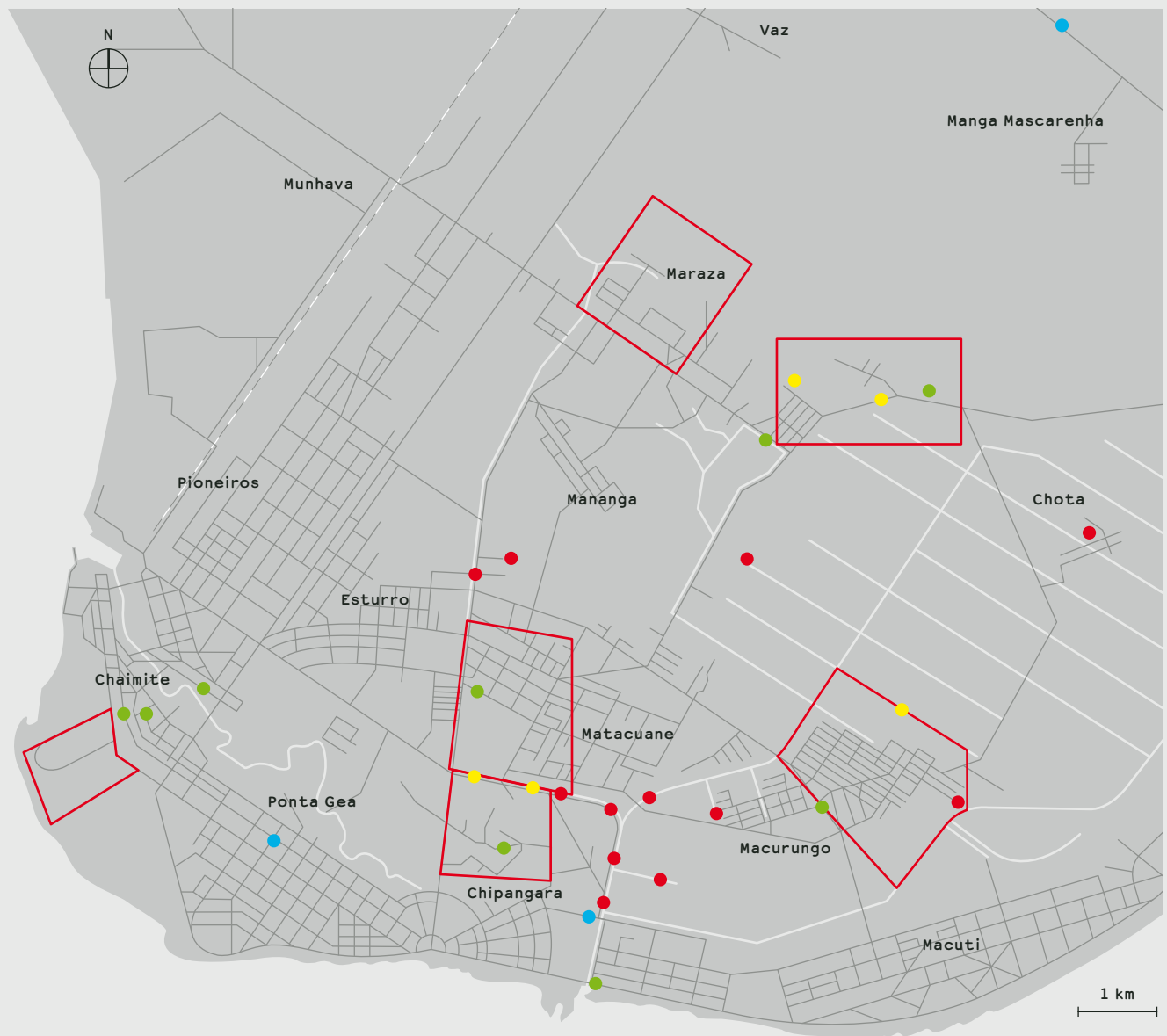
Partnerships for disaster risk reduction

Beira's city government is aware of the risks. In cooperation with the National Institute of Disaster Management (INGC) and the Ministry of Coordination of Environmental Affairs (MICOA), IP Consult/AMBERO, financed by the German government, implemented the first two phases of the "Adaptation to Climate Change by Applying Disaster Risk Management Measures in the City of Beira" project in 2010 and 2011. Collaborating with the city administration and the population of townships particularly endangered by climate change, the project first focused on the analysis of climate-related risks for the population and the infrastructure. In a second step, six local self-help disaster risk reduction committees were founded in particularly endangered townships. Their voluntary members evaluate risk situations, identify and implement local prevention measures, and coordinate possible decentralised evacuations. Following this, the DRR committees were linked to governmental institutions such as the city council and INGC to coordinate their voluntary action with state intervention. All of these actors were trained on issues of climate change and potential risks in an urban context.

The RISK Award helped to conclude the project and to make the efforts sustainable. The first milestone for sustainable implementation was a major disaster event simulation in October 2012. In the beginning, it was planned to carry out the simulation in two districts. However, the efficient allocation of resources allowed the RISK Award winner to implement the system in all six settlements, namely Praia Nova, Chipangara, Chota, Macurungo, Maraza and Matacuane, together with established local disaster risk committees.



Project areas in Beira



The points that are relevant for the warning system are marked on this map. The warning sensors are distributed to ensure that the largest areas possible in the poor districts of Chaimite, Munhava, Matabuane, Macurungo, Chipangara and Chota are covered. Warning drills with the local population were held prior to the rainy season in the areas outlined in red.

- Mechanical climatological stations warning sensors
- Warning sensors
- Warning sensors activated in simulation
- Radios for communication
- Areas covered by simulation

Why people-centred early warning is important

Effective early warning systems are without doubt important. However, there are major differences in international comparison. Many of the developed, rich countries have excellent and technically advanced early warning systems. In Germany, storm warnings are sent as spot-on txt messages for each individual postal code, thus allowing timely initiation of protective measures. In the USA, warnings are issued intensively when hurricanes are about to strike. Real-time reports on how the storm is spreading, its strength, direction, landfall area and the people that will probably be affected are broadcast over the media. However, in August 2005, Hurricane Katrina, which cost 1,280 lives in New Orleans, in one of the richest countries of the world, made it clear to us that even a technologically sophisticated warning system is of no value if warnings do not reach the people at risk in time, or if there is little awareness of risk-adequate response.

In New Orleans, many factors led to people not following the evacuation orders – almost all of them were related to poverty. Only when those at risk are informed of the repercussions of earthquakes, tornadoes and floods, and know what must be done and how they can protect themselves, is there a chance of reducing fatal outcomes in the long term.

Catastrophe prevention must begin with the people at risk and their immediate needs and capabilities. Adequate protection systems make provisions for how people at risk in different cultural circles and with different levels of education and wishes react to natural hazards. Risk awareness is the key. The flood warning systems in Central Mozambique in Beira take this important aspect into consideration. They integrate people in the communities and city districts at an early stage. The annual warning drills prior to the rainy season keep knowledge alive, in the event of a crisis the players can respond quickly.



Evacuation and emergency drills prior to the rainy season are a central element of a functioning early warning system. During this drill, the residents are warned with the help of megaphones and colour-coded flags. Drums and whistles are used additionally in rural areas. The drills contribute to capacity building.

The technical system – Schematic diagram

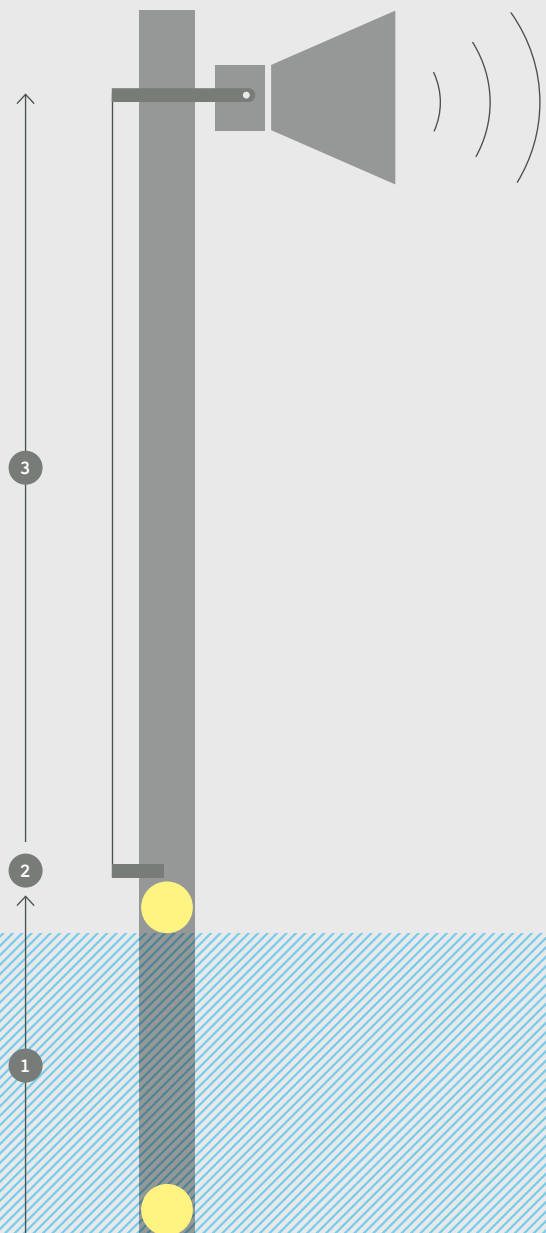
The technology used to give warning of the impending danger is remarkably simple, and can be understood in all corners of the world. Snorkel-type tubes are installed at strategic points in rivers, streams and drainage channels. They contain a styrofoam stopper covered with a conductive coating. Whenever water levels rise, the stoppers also float upwards and, when they reach a certain level, trigger an electrical switch. This in turn sets off alarm sirens, giving the residents time to take themselves and their belongings to a place of safety. The alarm sirens needn't be attached directly to the poles. The warning device can be linked via cable and e.g. be installed in areas or houses nearby.

Central elements

- 1 If the waters rise, the metal stopper floats upwards.
- 2 When it reaches a certain level, the stopper triggers an electrical signal.
- 3 This sets off an alarm siren.

Flood alert level

Standard river level



Preparation



A local flood committee in Chipangara presents itself. The helpers have name tags indicating their scope of responsibility and identifying them as flood helpers. Their equipment includes shovels and wheelbarrows. The flags are particularly important, as the colours stand for different warning stages. A risk map can be seen in the background (bottom right). Mapping risk zones and safe evacuation routes is an essential component of training courses for the flood committees.

During preparations for the simulation, the project was presented to the INGC delegation in Sofala, to the mayor of Beira City Council and also to the technicians of the Department for Disaster Risk Management, Climate Change and Coastal Protection. The introductory workshop presented the main objectives and indicators. A detailed work plan was drawn up and discussed with the partners and weekly meetings between the project team and the partners agreed. Emergency kit requirements were also assessed. The assessment revealed the need for the supply of equipment articles such as emergency vests, whistles and megaphones. This equipment was formally handed over to the committees by the INGC General Director during his visit to Beira on 19 October 2012.

Awareness in the six local disaster risk committees was also raised in workshops. The focus was on preparedness and therefore addressed the revision of existing emergency plans and the improvement of local neighbourhood plans with the aim of improving the coordination of activities. During further activities, the local disaster risk committees were continuously trained in disaster risk management. Furthermore, each disaster risk committee was assisted in developing alert plans for their own community. Evacuation maps using cadastral maps of Beira were developed and now play a crucial role in disaster risk management planning. Some were also digitalised using GIS tools.



A key moment: representatives of the flood committee install a flood warning pole at a canal in Chipangara. Usually, there is no water in the canal for many months. However, in the case of strong rainfall it can become a hazard within a matter of hours and lead to flooding.

Official legitimization

To embed the activities in official frameworks, the RISK Award winners closely worked together with a series of institutions. INGC, the Beira City Council, the fire department, the Mozambican Red Cross, the Provincial Health Directorate, the Mozambican Defence Force, the Mozambican police and the district services for education were invited to participate in several preparatory meetings. The aim was to:

- i) Present and discuss the general simulation scenarios,
- ii) Present and discuss the flow of information and communication,
- iii) Establish the roles and responsibilities of the institutions involved and define the requisite and the available resources,
- iv) Present the Early Warning System for Beira and the areas to be targeted during the municipal simulation exercise.

As a result of these meetings, the stakeholders decided to establish a City Emergency Operations Centre (EOC). At the same time, the institutions agreed on the allocation of human and infrastructural resources for the simulation exercise.



A large number of authorities are integrated into the warning drills, among them the Red Cross, the Provincial Health Directorate, the Mozambican Defence Force and the Mozambican police. The photograph on the right shows Alcinda Abreu, Mozambique's minister for the environment. She received a copy of the RISK Award certificate from Thomas Loster (Munich Re Foundation) during a conference in Maputo in October 2012 in the presence of Ulrich Klöckner, the German ambassador to Mozambique.

Red alert in 2013

Ongoing and extreme rain beyond expectations led to heavy flooding throughout Mozambique in the first three months of 2013. The red-alert situation lasted until 12 March 2013. The floods mainly affected the Zambezia province in the north and Gaza province in the very south, where 80,000 people had to move to temporary shelters. The spring floods affected 250,000 people and killed 117.

The Sofala province in central Mozambique was affected, too, but not as badly as the north and the south. The picture below was taken during the events in Beira near the coast. The man standing on his flooded veranda was warned early enough and was therefore able to protect his house with sandbags.



Practical application – emergency training

On 20 October 2012, a cyclone and heavy rainfall simulation exercise for the city of Beira was conducted in Chaimite, Munhava, Matacuane, Macurungo, Chipangara and Chota. The main objective of this activity was to strengthen the coordination and operability of all the stakeholders involved in response operations and action before and during emergency events and optimise the local resources of the inter-institutional emergency system.

The different phases of the simulation were guided by two types of emergency information, in the form of special warning bulletins issued by the National Meteorological Institute INAM following the respective national alert scheme (blue, yellow, red). This allowed the emergency organisation to be directed from the beginning until the end of the simulation. At the same time, the city's sewage service reported on the status of the drainage system and the sea level.

Based on the information provided by the local disaster risk committees to the provincial and city EOCs, operative intervention capacities such as the municipal police, the national police, the municipal and airport fire departments, the Mozambican Red Cross, as well as the City Health Department were deployed in the neighbourhoods. During the same exercise, the neighbourhoods of Praia Nova and Macurungo were visited by a delegation including the Governor of the Sofala Province, the Vice-Minister for State Administration, the City Mayor, the General Director of INGC and GIZ' National Director. The purpose of this visit was to evaluate and observe the simulation event as well as to encourage and thank the local disaster risk committees and the local population for participating in emergency preparedness events. The participation level was very high. On the whole, more than 500 people took part in the drill. Evacuation routines were practised and the functionality of the emergency kits was tested for the real case.

Because of the detailed and intensive drills, people were able to easily commit the processes they had learned to memory. Many had an active role to play and the participants were very involved during the training. In a real emergency situation they will recall the routines automatically. This will help save lives and allow objects of value to be brought to safety.

Practising a regulated evacuation. The yellow rope plays an important role and serves as a reference point. As floods can occur at night too, it is particularly important to provide central lifelines for the people. Usually, when disaster strikes, there is a great deal of confusion and agitation, and chaos must be avoided.





The extensive cyclone and flood-warning simulation in Beira took place on 20 October 2012. During an evacuation, people must concentrate on what is most important. They must also learn which items to take with them during an evacuation and which objects are a hindrance.

Lessons learned

Conclusion

The participants identified four key areas which must be strengthened in the future to deliver smoother response:

- i) Intervention of operative personnel on the ground,
- ii) Members and coordination within the city's EOC,
- iii) Communication and information management,
- iv) The use of DRM tools (maps, plans, etc).

“Making the City of Beira resilient to Floods and Cyclones” can be considered a great success from the impact point of view. Apart from continuing and deepening the work with local disaster risk committees, municipal and national institutions, the work – especially the city-wide simulation exercise – was vital to test and train the acquired know-how on a larger scale. Evaluations of this event demonstrate that DRM procedures in Beira are generally working but they also pinpointed a deficiency of individual stakeholders in maintaining the information flow. In view of this fact, it was generally requested to repeat large-scale simulations in Beira on a regular basis. The first RISK Award project could therefore serve as an inspiration for further activities to follow and guarantee a sustainable result.



Debriefing in an INGC office in Beira. Representatives from the authorities and the chief meteorologist of Mozambique, Moisés Benessene, are seated around the table. Also present: representatives of the GIZ, Munich Re Foundation and the University of Cologne who installed the meteorological measuring devices along the country's rivers.

Excursus: The Buzi model – Early warning in rural areas

The RISK Award project focuses on building resilience in the urban context. Of course, early warning in the rural context plays an important role, too. The Munich Re Foundation and its partners INGC and GIZ, including IP Consult, have been active for years in rural central Mozambique. The work there also focuses on local flood committees. However, in rural early-warning systems, people living upstream play a crucial role: they have to warn the communities living downstream. A widespread EWS has been installed along the Búzi, Save and Revuè rivers. The EWS performed successfully during many recent floods, e.g. in 2007, 2008 and 2009.

At the beginning of the project, a number of villagers were nominated for the job of measuring daily precipitation levels at strategic points in the Búzi river basin. Water levels along the river are also monitored using straight-forward gauges. In the event of particularly heavy rainfall or critical water levels, this information is passed on by radio.

Should reports reaching the central coordination point indicate widespread heavy rainfall, the alarm is raised. The gauges that measure the depth of the river are key elements in the monitoring process. The people living in the area undergo special training to alert them to the dangers. A system of coloured flags is used to signal a flood warning. Pre-designated helpers are sent out armed with megaphones to raise the alarm. Areas at risk are evacuated. Local disaster prevention teams have not only been formed in a number of Búzi river basin villages but also in further river basin areas. The model of small task forces is so successful that it is being replicated in a growing number of river basins in Mozambique. Data collection is furthermore improving year by year. Additional solar-driven gauging stations secure a constant data flow. Today the Buzi model serves as a role model for nationwide disaster risk management in Mozambique.



The Búzi flood-warning system

The map shows a flood-warning system which has been built up along the Rivers Búzi, Save and Revuè over recent years by the Munich Re Foundation together with the GIZ. Usually, heavy precipitation in several of the villages marked in yellow leads to a flood wave. The people in the communities marked in red along the lower reaches of the rivers are warned and can bring themselves and their belongings to safety.

- Measure
- Warn

Three questions put to João Ribeiro, INGC Director in Mozambique

Mr. Ribeiro, Beira is the winner of the 2012 RISK Award. What does this mean to the city and to Mozambique?

It's great to have been selected from so many good proposals. The INGC, GIZ and IP Consult are long-standing partners. Our aim is to optimise disaster management and establish best-practice examples. We have already acquired two years' experience from our work in the capital, Maputo, and other cities. The current objective is to establish an easy-to-replicate model in Beira. In other words, we regard the RISK Award more or less as confirmation of the success of our endeavours. That success is a real boost, and a good thing for risk management throughout Mozambique as a whole.

Why is disaster management so crucial to your country?

Mozambique is highly vulnerable to extreme weather events. Some 800 people lost their lives during major flooding in 2000. There have been floods on a number of rivers, and notably the Zambezi, every year since 2007. That sort of frequency was previously unheard of. There are also more and more cyclones and Mozambique now suffers a tropical storm almost every year, not to mention the droughts that threaten our food supply. The ideal solution would be a complete overhaul of our national risk management, not least with the impact of climate change increasingly making itself felt. But that option is precluded by financial constraints. The most viable alternative is to set up as many local committees as possible. That gets down to grass roots level, so that even in hard times success is possible throughout the country as a whole.

What do you consider to be the cornerstones of successful risk prevention?

The main factor is the head of state. Success is only possible if the president has the clear political will to promote risk prevention. Our President, Armando Emílio Guebuza, subscribes to the motto: "Prevention is better than cure". If the relevant institutions and society apply the message in practice, that will be a big step forward. The second success factor is that decisions on frameworks are centralised (top-down) and decision-making on the ground is flexible and tailor-made for the committees (bottom-up). Of course, risk management can only function as part of development policy. Risk prevention is a complementary part of poverty eradication, infrastructure improvements and other objectives. This is an area where we in Mozambique are on the right track.



João Ribeiro is responsible for disaster management in Mozambique. Since 2008, he has headed the National Institute for Disaster Management of Mozambique (INGC) which operates under the Ministry of State Administration.

Facts on Beira

Beira is the second largest city in Mozambique with 450,000 inhabitants and is shocked regularly by natural disasters. Many migrants from rural areas, seeking for a better life in urban areas are moving into town. The population has almost doubled since 1980. New neighborhoods were mainly built in swamp areas, close to the shore. This is raising the potential of risk. Also, as a result of the climate change, the sea levels and the groundwater level are rising. Heavy rainfall is increasing and flash floods are the result. If the frequency and intensity of cyclones from the Indian ocean are rising, the risks will exacerbate. Rain turns rivulets into raging rivers within minutes and storms are pushing seawater into the channels. Informal townships, where the poorest people live, are particularly vulnerable.

Our early warning system helps people to bring themselves and their belongings in a safe place. Warnings are very important, especially during the night.

Insights

Access to clean drinking Water
Currently only 43% of the urban population has access to piped water, and of this number only 60% of them have access to water, which corresponds to the WHO minimum standards for safe drinking water.

Access to sanitation
Across the country, access to sanitation is estimated about 40%.

Growth rate of urban population
The current urban population growth rate of 6.4% per annum is one of the highest in Sub-Saharan Africa.

Access to basic infrastructure
More than 50% of the city's current urban households are without access to basic infrastructure such as potable water, sanitation and waste management and sustainable economic opportunities.

Rainy days per year in Beira
150



Project partners and references



IP Consult, Stuttgart



AMBERO Consulting
Gesellschaft mbH, Kronberg



Deutsche Gesellschaft für
Internationale Zusammenarbeit
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Conselho Municipal da Beira –
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About the 2012 RISK Award winner
IP Consult, Stuttgart

IP Consult is a German consulting company founded in 1979 working in cooperation with governments, private companies, civil societies and donor agencies. The company assists these institutions in the design and implementation of locally-owned and delivered development strategies. IP Consult has been a reliable partner for its clients and has confirmed this in more than 1000 consulting assignments in over 130 countries worldwide.

IP Consult, nowadays as part of the NIRAS Group, has 20 years of experience working in Mozambique, today mainly in the field of capacity building of government institutions. In association with AMBERO Consulting, IP Consult effectively supports Mozambique's strategies and policies regarding disaster risk management and climate change adaptation. The main focus of the measures lays in supporting the design and implementation of people-centered early-warning systems in rural and urban areas. By advising its partners in creating and training local disaster risk committees to react to natural hazards, – also by increasing their forecasting capability – people are able to a faster implementation of evacuation measures, thus reducing human and economic losses. These cost-effective systems are today some of the most frequently named best-practice projects worldwide when it comes to low-tech and low-cost risk reduction towards natural hazards.

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