



Co-funded by the
Erasmus+ Programme
of the European Union



The Requirement Analysis Report

CIDMA Project

Climate Change Induced Disaster Management in Africa

May 2020



Table of Contents

| | |
|--------------------------------|----|
| 1. Introduction | 3 |
| 2. Aim | 3 |
| 3. Methodology..... | 3 |
| 4. Results..... | 3 |
| 6. Summery/ Conclusion | 17 |
| Annex I | 19 |
| Questionnaire | 19 |
| Annex II | 28 |
| Organizations Interviewed..... | 28 |



1. Introduction

Mozambique is one of Africa's most vulnerable countries to climate change. Poverty, weak institutional development, and frequent extreme weather events make Mozambique especially exposed. Climate-related hazards such as droughts, wildfires, floods, and cyclones are occurring with increasing frequency, having a cumulative and devastating impact on a population that is insufficiently prepared.

Disaster situations with famine, infrastructure breakdown, forest and vegetation fires, loss of property, and failure in sustaining the societal aegis. Capacity building is thus necessary throughout the system handling disasters in Mozambique. Crucial in this sense is that there is a need to increase the number of highly educated staff available, and that these are trained by specialists in the area of disaster management.

The Mozambican disaster management society is lacking a common disaster management tool (DMT) for making data and models accessible, and to make comparable studies in different regions of the country. Such a tool can be used to collect and visualize disaster related data, as well as model potential scenarios of climate induced disasters. During disaster events, such a system can assist authorities as well as the public, e.g. by communicating challenges like fires, flood events, landslides, and damages in infra-structure.

2. Aim

Two main aims of the need analysis in line with the main objectives of the project are:

- Identifying the most important disaster management issues in Mozambique to be used for the development of the innovative courses.
- Identifying the basic requirement for the development of the DMT.

3. Methodology

Visiting organizations, interviews with experts and filling questionnaires were used together, for the requirement analysis. The questionnaires were developed by CIDMA participants during the kick-off meeting in Lund in January 2020 to collect information and identify need analysis (Annex-1). In total, 59 experts from target institutions have been interviewed. The list of visited/interviewed organizations is given in annex-2.

The meetings were held during the period February-April 2020. Due to Covid19 pandemic the physical contacts with the interviewees have been significantly limited and the interviews have been mostly conducted online using communication via e-mail, WhatsApp and phone calls.

4. Results

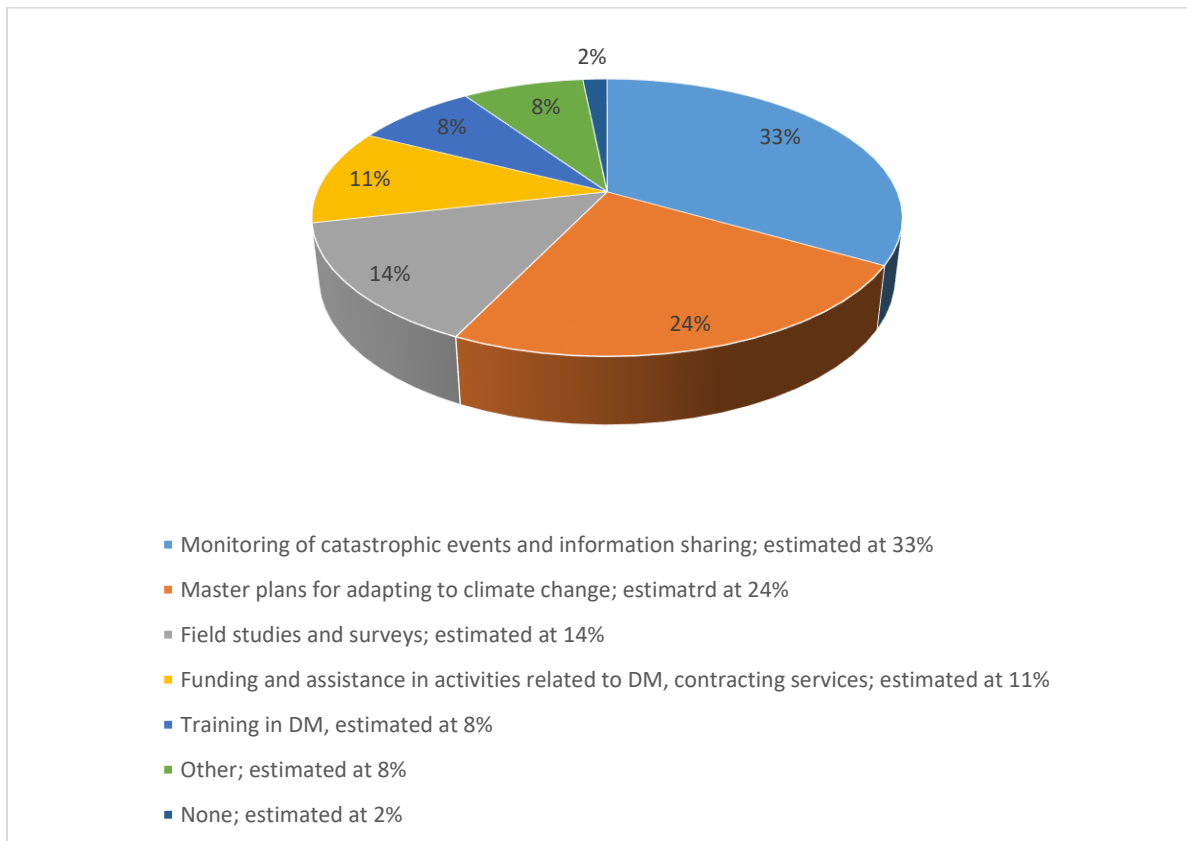
The results of the need analysis at the regional level conducted in the South, Middle and Northern parts of Mozambique have been summarized and combined in this Report by the following partners of the CIDMA project:

- Eduardo Modnlane University (Southern part of Mozambique)
- UniZambeze university (Middle part of Mozambique)
- UniLurio university (Northern part of Mozambique)

ANSWERS FOR QUESTIONNAIRE 1:

1. How does the Organization perform Disaster Management?

According to the interviewee responses, there is a wide range of way the institutions perform the disaster management (DM), which may be roughly organized in the following groups:



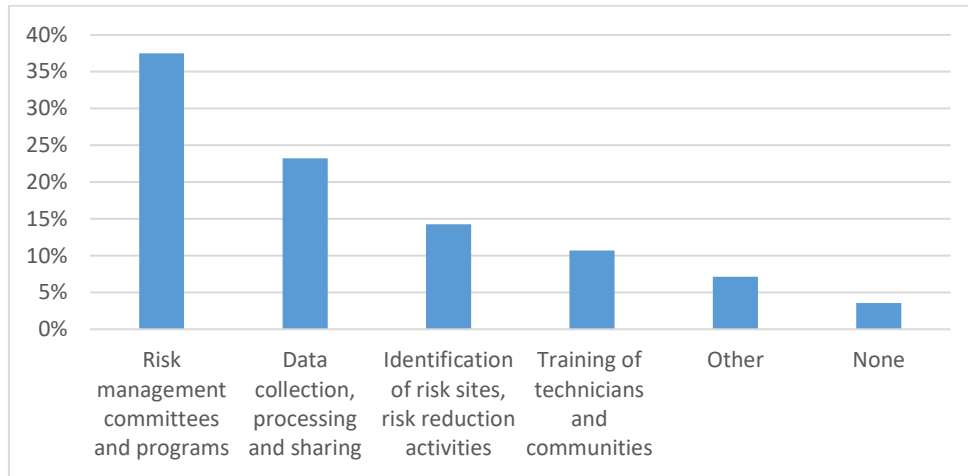
2. How does the Organization undertake/run Disaster Risk Management Programme(s)?

3.

Most stakeholder disaster risk management strategies fall into one or more of the following groups:

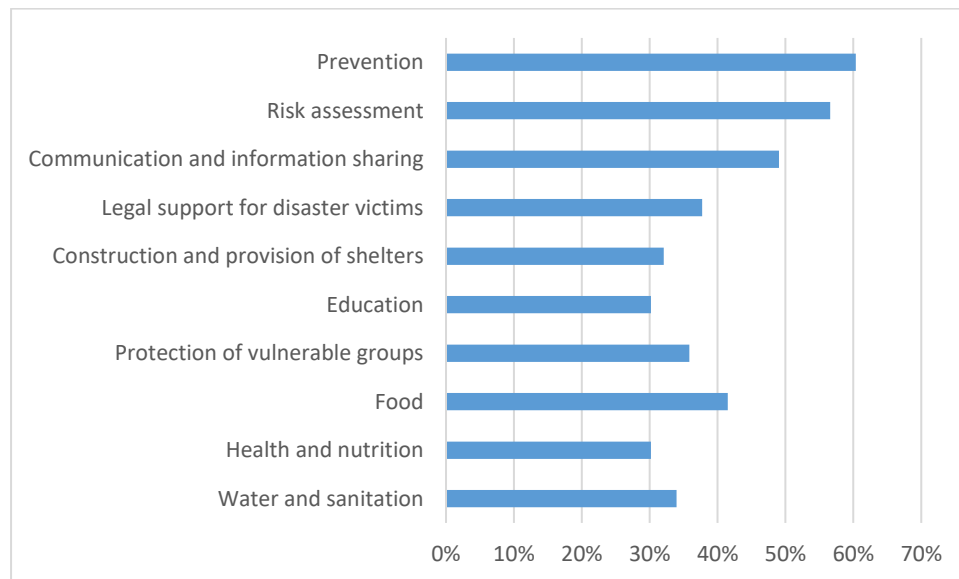
- Organizing and/or participation in the risk management committees
- Data collection, processing and sharing
- Identification of risk sites, risk reduction activities
- Training of technicians and communities

The proportion between these groups is given in the following chart



4. In which areas of Disaster Analysis/Management does your Organization act?

The interviewees were given a list of areas to choose from and were asked if they have other areas their organization perform in. The evaluation of the proposed topics is reflected in the following graph:



Other areas indicated by the stakeholders are:

- Post Disaster Needs Assessment (PDNA)
- Environmental management
- Access to resources (material and financial)
- Construction, provision and maintenance of road infrastructure
- Agriculture production and post-harvest conservation
- Adaptation to climate change

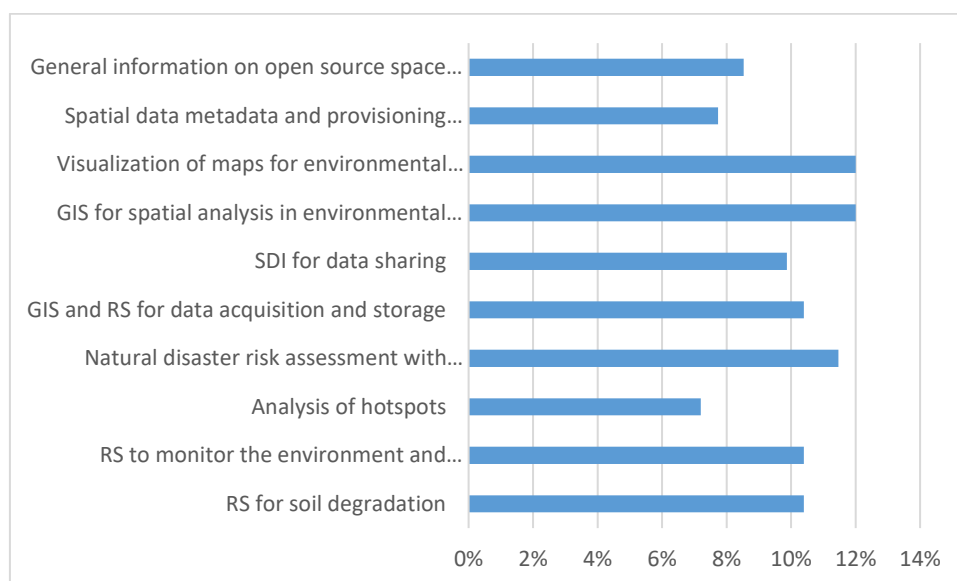
5. What types of topics and practical works on disaster management should be discussed in this course?

The following topics have been identified as important to be discussed in the course:

- **Disaster management** (prevention, prediction using GIS, modeling and planning for DM, emergency and DM, local DM, urban vulnerability to DM, territorial planning and management, land use planning, data for DM, cooperation for DM, latest advances, mitigation as DM tool, post disaster needs analysis, emergency response actions)
- **Risk assessment** (analysis, management, mapping, vulnerability, modeling, use of RS and GIS, erosion, mobile applications, prevention)
- **Floods and droughts** (flood-prone areas, prevention, modeling, water resource management, rivers course change, RD and GIS for water and sanitation, wetland management)
- **Population, society** (mapping of settlements, resettlements analysis, GIS for evacuation, identification of vulnerable, affected and needy, informal settlements in wetland, constructive resilience for a developing society, vulnerability minimization strategies, mobile data processing for humanitarian assistance, legal support)
- **Environment** (mangrove degradation and protection, deforestation, mapping of habitats, soil fertility decline, soil degradation, ecosystem restoration, monitoring of marine ecosystems, Integrated coastal management)
- **Water and food security** (resilient agriculture, post disaster needs assessment)
- **Climate change** (methods of collecting meteorological data, adaptation, short-term and immediate weather forecast, interpretation of weather reports and terms, early warning systems using different existing models, impact of climate change, resilient agriculture for climate change)

5. What kind of topics relevant to Geographical Information Systems (GIS), Remote Sensing (RS) and Spatial Data Infrastructures (SDI) do you think are more relevant for the course development?

The interviewees found all the proposed topics almost equally important (see the chart below).





The additionally suggested topics include

- Big Data Processing Analysis
- Ease of access to information systems
- Use of drone image processing platforms for detection of deforestation areas, mines, etc.
- Access and interpretation of data by local actors

There were also given some comments:

Remote environment monitoring systems versus free access to other types of open source data & map visualization (themes proposed above) need, in our opinion, to be approached with some seriousness in the cyber context / world

Being a disaster management course I think that the topics should have more to do with disaster management, starting with early warning systems (weather forecasts for a certain period of days, weeks, or months), according to interventions during the occurrence of disasters, what kind of assessment to do right after a disaster occurs, with the GIS you can do the infrastructure damage assessment and others, and a disaster management course can also couple the issue of preparing for disasters as a way to leave the most resilient communities

6. Which type of indicators related to Disaster Management does your Organization use?

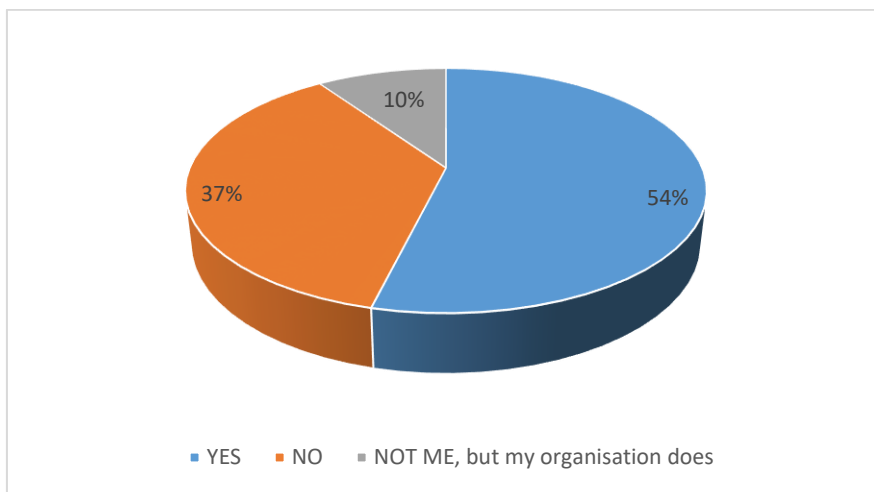
The following indicator have been identified as been used by the involved institutions:

- Affected Population and number of Families
- Number of people trained or sensitized on natural disasters and the impact on people's lives and the environment.
- Health Indicators that indicate the occurrence of pathology.
- Urban Growth
- Drainage Density
- Road Density
- Declivity and Impermeability
- Precipitation amount
- Percentage of docking and water loss in reservoirs
- Rainwater runoff levels
- Number of staff trained in Geographic Information Sciences and related areas involved in disaster management
- Capacity of national authorities linked to disaster management linked to predict the occurrence of a given phenomenon
- Level of dissemination of information to society
- Capacity for preparedness, response to disasters and recovery.
- Destruction of infrastructure
- Affected persons and devastated mangrove areas
- Damaged vessels
- Devastated fishing areas
- Devastated mangrove areas
- Number of stations available for data collection
- Coverage of water supply
- Safe zones created

- Sheltered families
- Reforested area
- Number of pluviometric and hydroelectric Dams built and rehabilitated
- Number of legal agreements with neighboring countries
- Affected or lost crops areas
- Number of irrigation systems built
- Exposure to drought and rising sea levels
- Soil erosion (including coastal)
- Flooding and rising sea levels

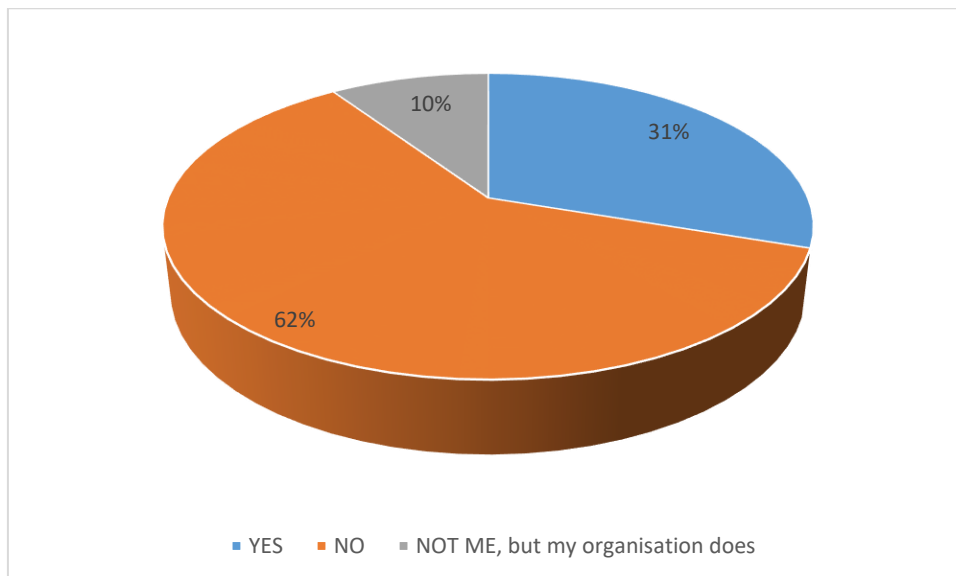
7. Do you use GIS in your daily work?

Most (90%) of institutions use GIS in their daily work:



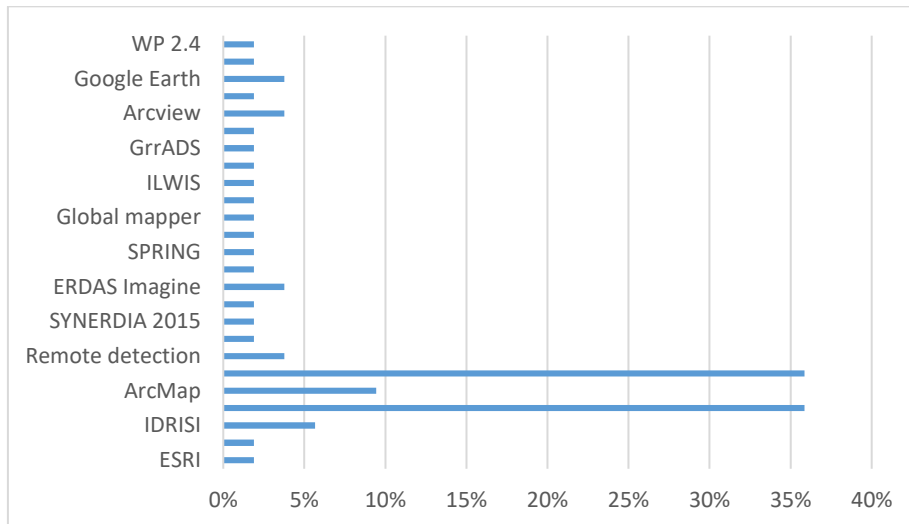
8. Do you use Remote Sensing data in your daily work?

90% of organizations do use RS data in their daily work:



9. What GIS and Remote Sensing software do you use? Please include versions if available

There are more than 25 different GIS and RS software programs used by the stakeholders with two clear favorites: QGIS and ArcGIS:



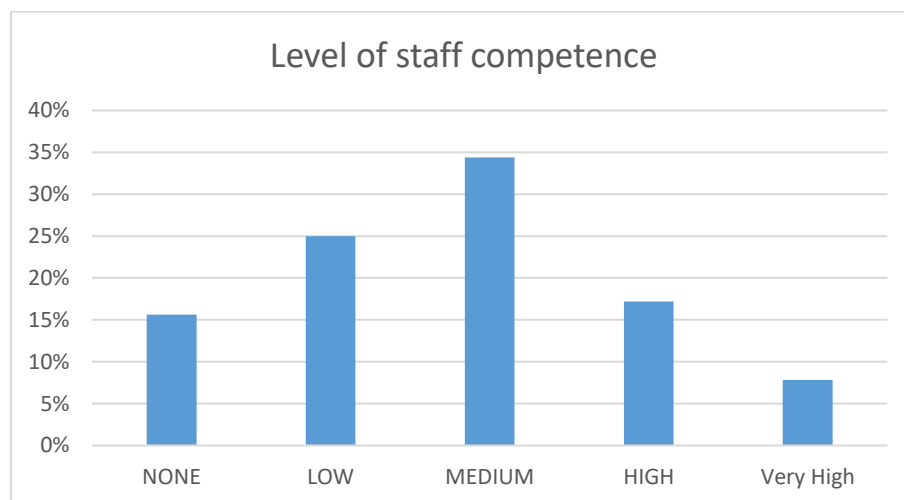
The institutions use QGIS program from 2.8, to 3.10 versions and ArcGIS program from version 9.2 to 10.7

10. Do you use other GIS and Remote Sensing software as intermediate tools for e.g. data preparation? If yes describe them into more details

Although almost half (46%) of interviewees answered that they do use other GIS and RS software, they generally failed to give more details.

11. General knowledge and skills of your organization employees on GIS and RS. % of staff involved in Disaster Management

Most of institutions have staff members involved in GIS and RS with medium level of qualification. There are also much bigger numbers of employees with low and medium level of competence in comparison with those who have high and very high level.





12. Do you have any program / willingness to improve the competence attending distance courses?

96% of interviewees answered positively to this question

13. Would you like your staff to attend distance courses on GIS and RS to improve their competence?

There is big interest (98%) among the institutions involved in the survey to improve the staff competence by attending the distance courses

ANSWERS FOR QUESTIONNAIRE 2

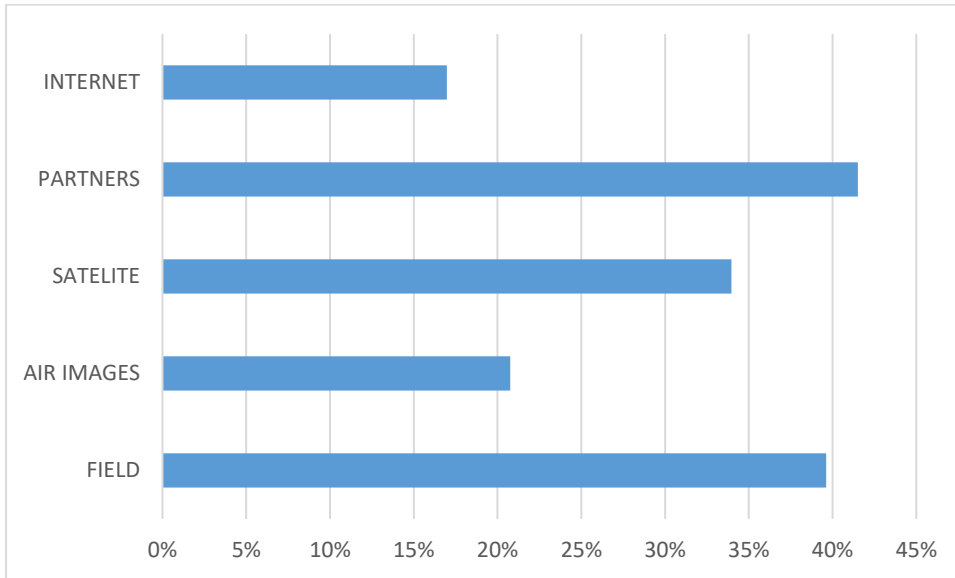
1. What types of spatial data do you use/or collect and update in your Organization?

The following data types have been identified as used by interviewed institutions:

- Vector data referring to parcels occupied by the population in the form of points (coordinates) and polygons.
- Administrative division, topography, public infrastructure, access roads, hydrography, access roads, soils, irrigation infrastructure, etc.
- Hydrography, Road network, contour lines, rated points, reserves, toponymical data
- Occasional health events ie the occurrence of diseases or health of the population of Mozambique
- Data of type Vector (Rinex, Shapfiles) and Raster (Tiff, PNG)
- Satellite images
- Aerial photographs
- Surveying data
- Risk areas for: Floods, cyclones, droughts, cyclone trajectories, and epidemics associated with natural disasters.
- Level curves, Ground cover
- Land use and coverage
- Geology / Geomorphology, Hydrography, Topography, Forests, Conservation areas, Access roads etc.
- Fishing areas, fishing ban area, reserve areas, resource recovery areas
- Provincial and national road network
- Risk zone maps
- Atmospheric pressure and relative humidity.
- Digital model of elevation
- Temperature and precipitation
- Roads, ditches, parceling and bridges maps
- Uncontrolled fires
- Affected zones
- Geometric (Ex .: Points, lines, polygons, etc.)

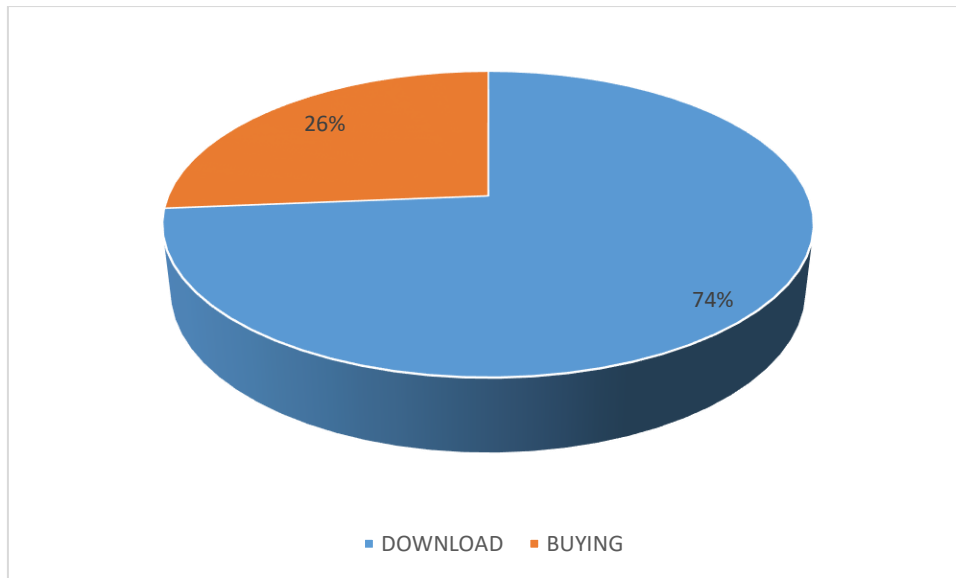
2. What are the data sources that your Organization uses to get GIS/ RS data?

The following data sources have been reported by the institutions:



3. How does your Organization get the RS data it uses? (Download, buy, etc.)

Most of institutions download data for free but in 25% of cases they have to purchase it:



4. What issues does your Organization face when downloading RS data?

The following related problems have been identified:

- Slow or week internet and network connection
- Data acquisition costs
- Low spatial and temporal resolution
- High Internet price
- Outdated data
- Limited storage space

5. What types of base maps/ spatial data does your Organization have? (Types, scale range, information content, metadata availability)

- Digitized topographic maps (1: 25000 and 1: 50000 scales), Land occupation map (1: 50000 scale), High resolution satellite images (GeoEye)
- Administrative division, topography, relief, types of climate, access roads, public infrastructure, hydrography, land use, etc.
- Map of land use and coverage, maps of detection of deforestation foci, maps of distribution of points for data collection, etc.
- Topographic chart in the scales: 1:25 000, 1:50 000, 1: 250 000 among others. Topographic map and land use and coverage: scale 1: 250 000. Map of the 5 Cities: Maputo, Beira, Quelimane, Nampula, Pemba and Ilha de Mozambique. Scale 1: 5 000 and 1:10 000. Contact photograph: 23X23 cm. Administrative division chart: 1: 2 000 000 and other scales. Maputo City Plan (address). Tourist chart. Relief letter. Road map. Orthophoto plane.
- Data particularly on forest distribution, conservation area boundaries, community distribution
- Maps resulting from the outputs of the weather forecast models. The scale of the maps varies according to the resolution of each numerical model (between 4 to 10 km of grid spacing). The generated maps are derived from the different meteorological parameters
- Occasional events such as the occurrence of pathology and health units
- Orthophoto of the 2010 photogrammetric flight; Cartographic basis resulting from the refund; Map Scales 1: 10000, 1: 5000
- Base maps of systematic cartography of the country at a scale of 1: 250 000 and 1:50 000, without metadata and digital spatial data. Some contents are soil, land use, administrative division, social infrastructure / equipment, temperature, precipitation, geology, hydrography, roads, etc.
- Cartographic maps of 1: 50,000 / 1: 250,000, Spatial data and written Doc from the Limpopo and Zambezi Disaster Atlas, and data on the Lidar aerial survey done over Limpopo
- Soils at scales 1: 100 000, 1: 250 000, 1:50 000 for Maputo and southern Gaza. Maps of potential land suitability for different cultures
- simple maps drawn in the community
- Road map, map of infrastructures and rivers
- Land use maps, Thematic maps

- Administrative, hydrographic maps, soil classification and varietal mapping
- Geographic and demographic maps
- Administrative, thematic, hydrographic and land cover and geological maps
- Simplified topographic charts 1: 250 000 and 1: 50 000
- Matrix data with information on occupied land parcels
- Maps of risk and vulnerability to natural disasters

6. What kind of maps/ spatial data does your Organization have for disaster management? If possible, indicate if each entry is updated information or not

- Land Occupation Map (Periodically updated)
- Environmental data (types of climates, weather stations, precipitation, temperature), population data, hydrography (rivers, lakes, river flows), administrative division (districts, towns, villages, villages), land use, seismic data and tsunamis;
- Maps of numerical weather forecasting models. Maps of topography and orography of various regions of the country and the region.
- Occurrence of Cholera in an emergency situation, mapping of malaria, HIV, etc., all obtained through studies
- Maps of international rivers that constitute a boundary between our country and the 6 neighboring countries (Tanzania, Malawi, Zambia, Zimbabwe, South Africa and the kingdom of Eswatini) updated every 5 years
- Orthophoto of the 2010 photogrammetric flight; Cartographic basis resulting from the refund
- Organization has mapped risks to natural disasters in some districts of the country, in partnership with INGC it is producing the Atlas for disaster response preparation in the Licungo Basin
- The institution has several types of spatial maps / data for disaster management (mentioned in previous questions), most of which have not been updated. Reasonably up-to-date data are those made freely available on the Internet by international organizations.
- Cartographic maps of 1: 50,000 / 1: 250,000, Spatial data and Doc written from the Limpopo and Zambezi Disaster Atlas, and data on the Lidar aerial survey done over Limpopo. Spatial data and reports on flood risk areas in the districts of (list the districts that have already been mapped).
- Vulnerability maps, risk maps, flood maps, administrative maps, CLGRC indicative maps, shelter maps, resettlement location maps, contour maps, environmental maps
- Soil Maps
- Spatial maps / data available: areas of risk of floods and floods, cyclone trajectories, other cross-cutting data of interest for disaster analysis (eg road network, mobile phone, etc ...)
- Land use and vegetation
- Risk mapping, land use, Venus diagram
- Topographic maps
- Maps of areas prone to flooding, soil fertility maps

- Hydrological maps
- Risk maps, flood maps, administrative maps, shelters maps, resettlement maps, level curves maps, environmental maps
- Maps of hydrological basins, network of hydroclimatic stations and water quality collection points.
- Data on topography, geology, geomorphology, soils, hydrology, vegetation, land use and socio-economic infrastructure, Macro zoning maps of the Districts taking into account their potential and map of plot occupations and their use.

7. What kind of maps / spatial data does your Organization have for disaster risk analysis/ management?

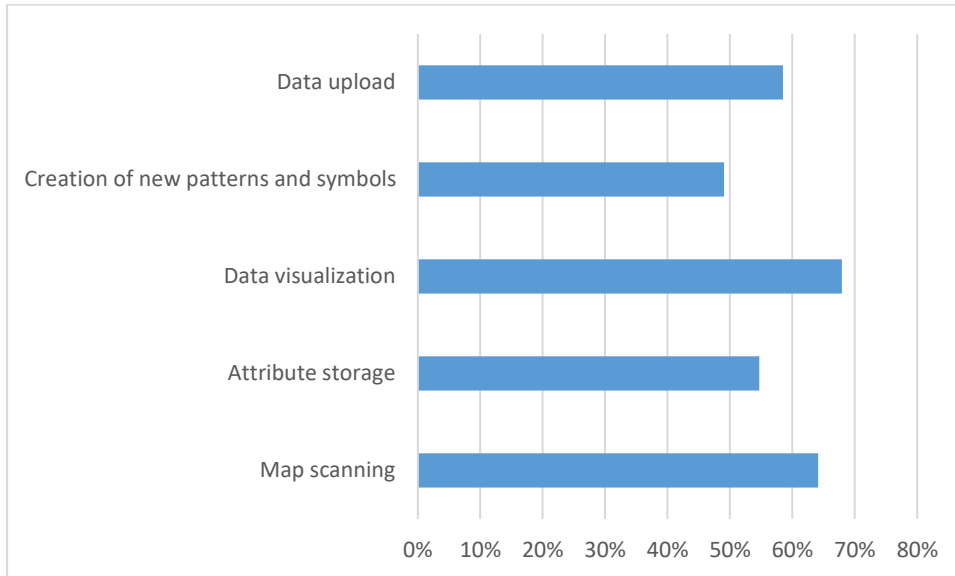
- Land Occupation Map (Periodically updated)
- Topographic environmental data (types of climates, weather stations, precipitation, temperature), population data, hydrography (rivers, lakes, river flow), administrative division (districts, locations, villages) , villages), land use, seismic data and tsunamis (magnitudes and intensity);
- Satellite images and vector data
- Vegetation distribution maps. Conservation area maps. Demographic distribution maps
- Maps of numerical weather forecasting models. Maps of topography and orography of various regions of the country and the region.
- Occurrence of Cholera in an emergency situation, case mapping of malaria, HIV, etc.
- Satellite Images, Administrative Limits, Infrastructure, Land Use and Cover, Census Information, Transport, Hydrography
- Orthophoto of the 2010 photogrammetric flight; Cartographic basis resulting from the refund
- Maps of areas at risk of floods, cyclones, earthquakes and drought, high-resolution images captured using drones (damage assessment images after cyclones Idai and Kenneth)
- Contour maps, land cover maps, hydrological maps, road maps, demographic maps
- topographic maps
- road and hydrological map
- risk management shepfiles
- Topographical maps

8. Is the data used by your Organization restricted, or free and available for use and/or publication?

50% of institutions use data with restricted and conditional access and 50% with free or open access. Most institutions reported their data as available for use and publications

9. Which functionalities does your Organization expect from DMT?

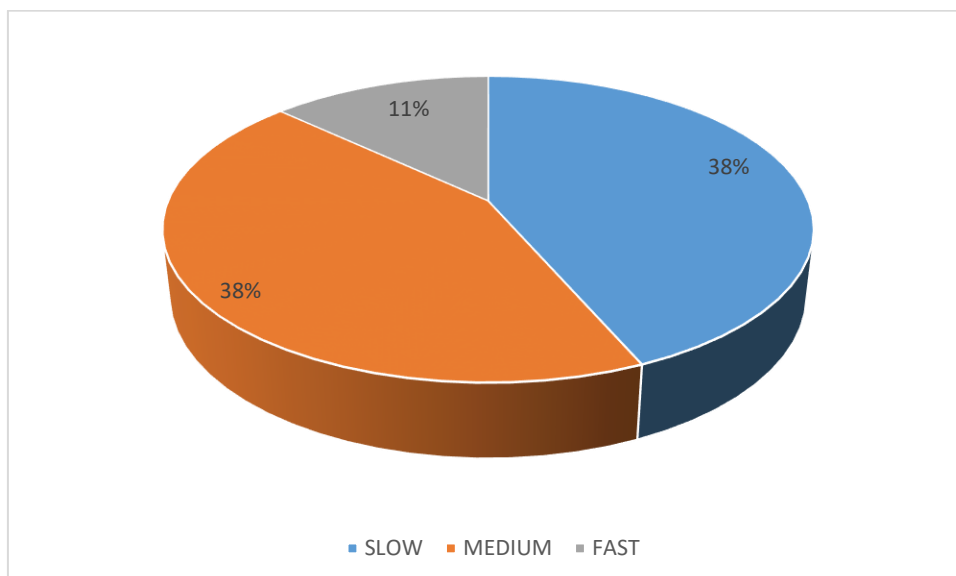
All proposed topics have been found important by the majority of interviewees:



The additionally suggested functionalities are:

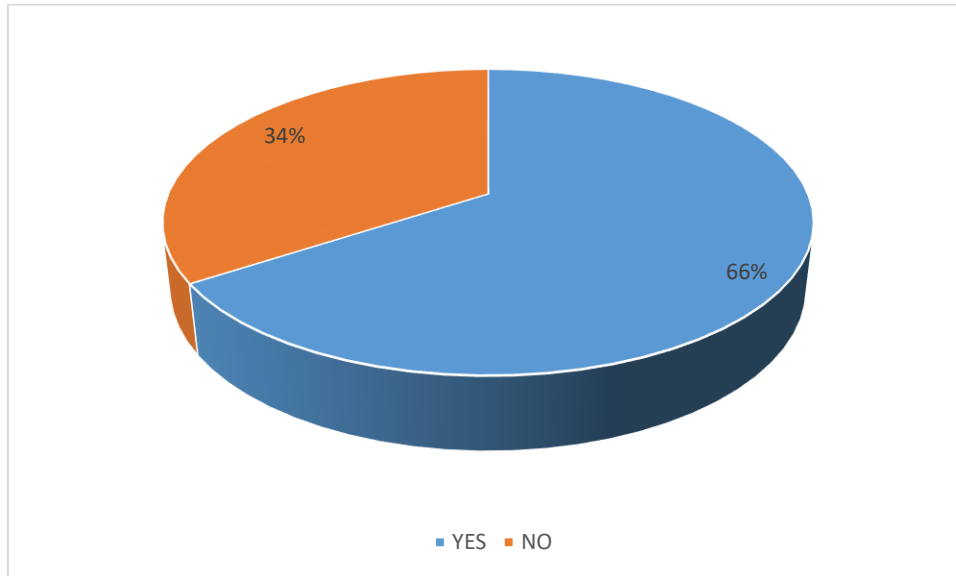
- High resolution images availability
- Availability of recent and better resolution satellite images
- Data analysis
- Mobile/web applications combined with GIS for disaster risk management
- Planning and decision making
- Risk zone assessment

10. Does your Organization have a fast / medium or slow Internet connection? (if possible specify upload/download speed)



11. Does your Organization have any mechanism for data sharing? Describe it if any

Two thirds of institutions have mechanism for data sharing:



6. Summery/ Conclusion

The conducted survey showed that most of target institutions perform different types of activities related to DM in one or more of following fields:

- Monitoring of catastrophic events and information sharing
- Master plans for adapting to climate change
- Field studies and surveys
- Funding and assistance in activities related to DM, contracting services
- Training in DM

Most stakeholders' disaster risk management strategies fall into one or more of the following groups:

- Organizing and/or participation in the risk management committees
- Data collection, processing and sharing
- Identification of risk sites, risk reduction activities
- Training of staff and communities

Targeted organizations act in a wide range of the Disaster Analysis/Management areas including water and sanitation, health and nutrition, food security, protection of vulnerable groups, education, construction and provision of shelters, legal support for disaster victims, communication and information sharing, risk assessment, prevention, Post Disaster Needs Assessment, environmental management, access to resources (material and financial); construction, provision and maintenance of road infrastructure, agriculture production and post-harvest conservation, adaptation to climate change.

The interviewed institutions indicated a wide range of topics and practical works on disaster management to be included into the developed courses in the fields of disaster management, risk assessment, floods and droughts, population and society, and environment

Most of stakeholders agree with the proposed list of topics relevant to Geographical Information Systems, Remote Sensing and Spatial Data Infrastructures.

Most of institutions use GIS RS data in their daily work. They use a big number of indicators with different types of software in which different versions of QGIS and ArcGIS are clear favorites.

Although some target institutions have staff qualified in DM, most of them showed significant shortage of trained staff especially in medium to high level. Practically all the institutions have big interested in attending the courses to be developed within the CIDMA project by their staff members.

Most of the institutions have huge amount of spatial data such as ariel photography, satellite images, topographic and thematic maps of different resolutions, etc., which they acquire



through fieldwork, internet or from partners. There are some issues related to downloading/processing of this data, namely:

- Slow or week internet and network connection
- Data acquisition costs
- Low spatial and temporal resolution
- High Internet price
- Outdated data
- Limited storage space

There is a big interest among most of target institutions in using the DMT with the proposed functionalities:

- Map scanning
- Attribute storage
- Data visualization
- Creation of new patterns and symbols
- Data upload

Some interviewees proposed additional DMT functions, such as:

- High resolution images availability
- Availability of recent and better resolution satellite images
- Data analysis, planning and decision making
- Risk zone assessment



Annex I

Questionnaire

CIDMA project Description:

The main aim of our project is to build capacity, using spatial methods, for better management of climate change induced disasters in Mozambique. Detailed objectives of the project are:

- Developing innovative and blended courses in GIS/RS for disaster management: The developed courses will be offered by partner universities as short courses to the disaster management authorities in Mozambique. They will also be used as complementary courses in the master programs.
- Training of trainers: Faculty members at the partner universities will be trained on how to teach the developed courses. The ability of local teachers to teach and update these courses guarantees lifelong learning and continuation of the education and usage of the courses.
- Improving quality in education and teaching: Online learning techniques/tools have revolutionized the pedagogic world. Mozambican partners will be equipped with e-learning and open network learning (ONL) tools. This makes it possible to offer standard GIS/RS courses as well as the specialized courses developed in this project, online. Online programs/courses provide stakeholder employees under geographical or professional constraints to start a university program, with the possibility to learn more about GIS/RS and its applications in disaster management, and so get new competencies.
- DMT development: A web-based tool for disaster management will be developed and implemented. The aim is to make disaster related spatial data widely available for stakeholders in Mozambique to be able to use it for a better disaster planning and decision-making. DMT can be further developed to satisfy additional requirements of the stakeholders in the future.
- Dissemination of the outcomes: Disaster management authorities, at policy-making, planning, and operational levels, will become aware of the advantages and applications of GIS/RS in disaster management to support the development and use of GIS/RS in their countries. They will also get possibilities to gain required skills to be able to use GIS/RS in planning and decision-making for disaster management.
- Developing HEIs within society: The links between HEI, governments, and companies are not well established in Mozambique, especially when it comes to disaster management and GIS/RS. As a result, students may not find adequate jobs after graduation. One aim of this project is thus to strengthen these links making stakeholders aware of the technologies they need to use and the educated group of graduates that can be employed to support these technologies.



WP 2. Information collection and need analysis for course development

QUESTIONNAIRE 1

Organization name:

Date:

Other Notes:

1. How does the Organization perform Disaster Management?

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

2. How does the Organization undertake/run Disaster Risk Management Programme(s)?

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....



3. In which areas of Disaster Analysis/Management does your Organization act (select from the list below)? Rank each of them according to their importance to your country.

| Rank | Application areas |
|------|--|
| | FILL POSSIBLE OPTIONS |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | Other areas. Please specify |

4. What types of topics and practical works on disaster management should be discussed in this course?

| Mark | Offered topics |
|------|-----------------------|
| | FILL POSSIBLE OPTIONS |
| | |
| | |
| | |
| | |
| | |
| | |
| | |



| | |
|--|--------------|
| | |
| | |
| | |
| | |
| | |
| | Other topics |
| | |
| | |
| | |
| | |

5. What kind of topics relevant to Geographical Information Systems (GIS), Remote Sensing (RS) and Spatial Data Infrastructures (SDI) do you think are more relevant for the course development?

| M a r k | Offered topics |
|----------------------------|---|
| | RS for soil degradation |
| | RS for monitoring the environment and land cover change |
| | Hotspot analysis |
| | Natural disaster risk assessment with spatial analysis methods and techniques |
| | GIS and RS for data acquisition and storage |
| | SDI for data sharing |
| | GIS for spatial analysis in environmental management |
| | Map Visualization for environmental management |
| | Spatial data metadata and provision requirements |
| | General information on free spatial resources and other types of open source data |
| | Other topics |
| | |
| | |
| | |
| | |



6. Which type of indicators related to Disaster Management does your Organization use?

.....
.....
.....
.....

7. Do you use GIS in your daily work?

| | |
|--|------|
| | No |
| | Yes. |

If yes, in which type of processes? (Digitizing maps, risk assessment, site selection, map production, spatial data storage, etc.)

.....
.....
.....
.....
.....
.....
.....
.....

8. Do you use Remote Sensing data in your daily work?

| | |
|--|------|
| | No |
| | Yes. |

If yes, with which types of RS data (optical / multispectral / SAR / thermal, etc.)? And with which type of processing (image classification, change detection, map production, etc.)?What is the last update of each entry?

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

9. What GIS and Remote Sensing software do you use? Please include versions if available.

.....
.....



.....

10. Do you use other GIS and Remote Sensing software as intermediate tools for e.g. data preparation? If yes describe them into more details.

.....

11. General knowledge and skills of your organization employees on GIS and RS.

| Average knowledge | Number of persons | % of staff involved in Disaster Management |
|-------------------|-------------------|--|
| Nothing | | |
| Low | | |
| Medium | | |
| High | | |
| Very high | | |

12. Do you have any program / willingness to improve the competence attending distance courses?

.....

13. Would you like your staff to attend distance courses on GIS and RS to improve their competence?

| | |
|--|------|
| | No |
| | Yes. |



WP 2. DMT (Disaster Management Tool) need analysis

As a web-based tool, DMT will be used to facilitate the sharing of disaster related spatial data between organizations, both nationally and internationally. The aim is to make disaster spatial data widely available for stakeholders in Mozambique to be able to use it for better disaster planning and decision-making. The tool will also have a web GIS tool that can be used for data collection and storage. In this way, organizations can collect and share the information they need for environmental management, using a web-based and easy-to-use system. The web GIS will also provide them with basic spatial analysis tools needed to support planning and decision-making. The availability of such a system not only helps stakeholders to organize and manage the spatial data they need, but will also be a smooth introduction to the use of GIS in general, and GIS in particular, for daily activities, planning, and decision-making. DMT will be developed based on open source solutions, as well as existing Internet GIS tools available to 1) make the maximum use of available resources, and 2) reduce the development/software/engine costs. Copyright issues will be carefully considered.

QUESTIONNAIRE 2

1. What types of spatial data do you use/or collect and update in your Organization?

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

2. What are the data sources that your Organization uses to get GIS/ RS data?

.....

.....

.....

.....

.....

3. How does your Organization get the RS data it uses? (Download, buy, etc.)

.....

.....



.....

.....

.....

.....

4. What issues does your Organization face when downloading RS data?

.....

.....

.....

.....

.....

5. What types of base maps/ spatial data does your Organization have? (Types, scale range, information content, metadata availability).

.....

.....

.....

.....

.....

.....

6. What kind of maps/ spatial data does your Organization have for disaster management? If possible indicate if each entry is updated information or not.

.....

.....

.....

.....

.....

.....

.....

7. What kind of maps / spatial data does your Organization have for disaster risk analysis/ management?

.....

.....

.....

.....

.....

.....

.....



.....
.....

8. Is the data used by your Organization restricted, or free and available for use and/or publication?

.....
.....
.....
.....
.....
.....

9. Which functionalities does your Organization expect from DMT?

| |
|---|
| Digitizing maps |
| Storing attributes |
| Visualizing data |
| Designing new patterns and symbols |
| Uploading data |
| Other functionalities |

10. Does your Organization have a fast / medium or slow Internet connection? (if possible specify upload/download speed)

| | |
|----------------|---|
| measure (MBps) | Speed |
| | <input type="checkbox"/> Slow <input type="checkbox"/> Medium <input type="checkbox"/> Fast |

11. Does your Organization have any mechanism for data sharing? Describe it if any.

.....
.....
.....
.....
.....
.....



Annex II

Organizations Interviewed

1. Ministry of Agriculture and Rural Development
2. National Directorate of Land
3. National Institute of Hydrography and Navigation
4. Ministry of Land and Environment (National Fund for Sustainable Development)
5. National Center for Cartography and Remote Sensing
6. Foundation for the Conservation of Biodiversity
7. National Institute of Meteorology
8. National Institute of Health
9. Maputo City Council
10. National Directorate of Water Resources Management
11. World Food Program
12. National Institute for Disaster Management (3)
13. Ministry of Transport and Communications (Space Development Program)
14. Eduardo Mondlane University (department of mathematics and informatics)
15. Eduardo Mondlane University (department of geography)
16. Provincial Directorate of Agriculture and Food Security (Sofala)
17. Provincial Directorate of Sea, Inland Waters and Fisheries
18. District planning and infrastructure services (Beira)
19. District economic activity services (Dondo)
20. Municipal Council of Dondo City
21. District economic activity services (Beira)
22. National Road Administration (Sofala Delegation)
23. National Institute of Meteorology (Sofala Delegation)
24. Provincial Directorate of Public Building, Housing and Water Resources
25. Provincial Directorate of Land, Environment and Rural Development
26. District planning and infrastructure services (Dondo)
27. Sena Company (Marromeu)
28. Regional Water Administration - Central Zone
29. National Land Transport Institute
30. Marromeu Village Council
31. District economic activity services (Marromeu)
32. Provincial health directorate (Sofala)
33. Catholic University Faculty of Economics and Management
34. Provincial Directorate of Education and Human Development (Manica)
35. Provincial geography services to register
36. Mozambique electricity
37. Provincial Directorate of Agriculture and Food Security (Manica)
38. Food and Agriculture Organization of the United Nations
39. Food and Agriculture Organization of the United Nations - GEI
40. National Institute of Statistics (Manica)
41. National Institute for Disaster Management (Manica Delegation)
42. Provincial Directorate of Science and Technology, Higher Education and Technical-Professional



43. National Institute of the Sea and Frontiers
44. Regional Water Administration-North.
45. Provincial Directorate of Land (Cabo Delgado)
46. Environment and Rural Development Program
47. Provincial Directorate of the Sea inland waters and fisheries (Cabo Delgado)
48. Economic Development Agency
49. World Wildlife Fund
50. Provincial Directorate of Tourism and Culture (Cabo Delgado)
51. Christian Council of Mozambique
52. Provincial Directorate of Science, Technology, Higher and Technical Professional Education (Cabo Delgado)
53. Friends of the Earth Association
54. UniRovuma - Rovuma University
55. Fisheries Research Institute
56. Provincial Directorate of Public Works Housing and water resources (Cabo Delgado)
57. Pemba Secondary School (Cabo Delgado)