



Image: European Space Agency

Conference report

Strengthening technological capacities and information access for improving disaster risk reduction in the Horn of Africa

Wednesday 22 – Thursday 23 January 2014 | WP1283

Conference report

Strengthening technological capacities and information access for improving disaster risk reduction in the Horn of Africa

Wednesday 22 – Thursday 23 January 2014 | WP1283

Executive summary

The Horn of Africa faces multiple challenges from natural hazards, particularly water-related ones of drought and flooding. Other natural risks include earthquakes, landslides, volcanic activity and land degradation, among others. Certain areas of the region are arid or semi arid and have increasing populations living in highly stressed natural environments. The fight for survival and the competition for natural resources often lead to human conflict and other types of human cost. Communicable diseases (human and livestock) are hazards in themselves, but can also be associated with other hazards such as extreme weather conditions.

The problems posed by natural disasters cut across borders. Therefore the solutions to such challenges must also be cross-boundary in order to ensure sustainable and durable solutions. Disaster Risk Reduction (DRR) is an area where national and regional partnerships are critical across sectors, thematic areas and stakeholder groups. Sustainable development, poverty alleviation and DRR are mutually supportive objectives, and in order to meet the challenges ahead, greater efforts at the regional and national level must be made to build the necessary capacities to manage and respond to risk.

Science and technology have a vital role to play including, but not limited to, the collection, analysis and dissemination of relevant data. Such data can be used in mitigation as well as response and recovery initiatives. Engagement with end users of information and data is critical. Such end users include policy makers and development planners/implementers, academic and technical institutions, private sector and even the general public.

Many science/technology initiatives related to DRR exist in the region, and have contributed to building resiliency, but there is need for increased and targeted capacity development of regional mechanisms and organisations, as well as improved coordination and collaboration, and dialogue amongst various stakeholders.

Aim of the conference

The conference was organised to promote dialogue on DRR in the Horn of Africa, and to discuss how the use of science and technology can be applied to better serve DRR initiatives in the region. The Intergovernmental Authority on Development (IGAD) is a lead actor in DRR work in the region. IGAD member states are: Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Sudan and Uganda. The conference provided a forum for formal discussions as well informal consultations and sharing of knowledge between participants from the greater IGAD region, representing several sectors and organisations.

Objectives

The conference brought together key stakeholders from the IGAD region, including policy makers and experts. The aim was to promote and enhance collaboration on regional DRR programmes and projects in the Horn of Africa through improved use and sharing of technology and information. Experts from other parts of Africa, as well as other world regions were also invited to share their perspectives, best practices and lessons learned.

Participants were able to:

- Take stock of what initiatives exist in the region for science-and-technology-based DRR;
- Look at existing human and technological capacities for DRR work, as well as the information and knowledge base and gaps in countries and in the region;
- Share best practices and innovative approaches in using science and technology to support DRR at the regional level;
- Discuss how to enhance regional capacity and collaboration in DRR through the use of technologies and improved dissemination of information;
- Explore how to engage policy makers, political leaders and other end users of information;
- Consider ways to encourage greater investments and stronger political commitment for regional action in DRR; and

Create new professional networks amongst policy makers, technical experts, civil society, media and international organisations working on DRR and technological applications in the Horn of Africa.

Natural disasters in the Horn of Africa and the economic context and costs

1. It is not surprising that the forerunner of the Intergovernmental Authority on Development (IGAD) was known as IGADD - the extra "D" in the name stood for Drought. The original emphasis on drought reflects the importance of this natural hazard in the region. Moreover, many of the areas that are most affected by drought happen to be at boundary meeting points of several IGAD member states: Ethiopia, Kenya, South Sudan, Uganda and Somalia. Periodic droughts have ravaged the region from time immemorial resulting in human suffering including loss of life, loss of livestock and other means of livelihood, slowed development and other economic costs. Conflict over water and grazing sometimes leads to human conflict resulting in loss of life and displacement.
2. Other water-related hazards include those caused by too much rain - particularly flooding and landslides, which cause hunger, loss life and livelihood, soil erosion, and loss of economic investments.
3. Hazards caused by extreme weather are increasing in frequency and intensity, in part due to climate change but also environmental degradation.
4. While most of the effects of natural disasters in the region have been felt in rural areas, urban areas are not immune. Dangers to urban areas include seismic activity (where applicable), as well as flooding which is particularly hazardous in urban informal settlements without adequate drainage and sanitation infrastructure. Droughts in rural areas also negatively affect food security in cities especially among the urban poor.
5. Communicable diseases (human and livestock) are in some cases associated with weather conditions, hence are to some extent predictable or can be assessed as risks.
6. Natural hazards have wider economic and social costs including absorption of resources that could otherwise go into development as well as negative influence on potential investors. For communities living with recurrent unmitigated disasters, the human costs include continuous vulnerability, slow development, as well as conflict and displacement.

Building resilience to natural hazards and disaster risks in the Horn of Africa

7. Several initiatives for building resilience are being undertaken in the region by governments and Non-governmental Organisation (NGO) actors, academic institutions and development partners.
8. The use of early warning information is critical to the success of these initiatives, particularly when information from several national and regional institutions is used in advance to reduce risks involved. The significance of an effective early warning system lies in the recognition of its benefits by the end-users.
9. Examples from some of the NGOs working in disaster-prone areas in the region are illustrative. Early climate information is used to anticipate emergencies so that they can be averted where possible, or respond adequately. Many of the emergencies relate to drought and flooding, therefore providing food and water, and/or shelter and personal safety are key elements of response measures.
10. Beyond emergency response, there are several projects for at-risk communities to improve food security and livelihoods through provision of water for humans (including water for irrigation) and livestock. Boreholes and irrigation dams form a part of such infrastructure. In some cases engagement with communities includes introducing new economic activities, new foods and new survival mechanisms to complement traditional ones. This also helps to ensure more sustainable use of the natural environment.
11. Organising communities around such activities is also helping to build resiliency through improved human capital (protecting the social fabric and giving new skills and economic opportunities). Initiatives involving the private sector include insurance mechanisms covering a range of risks.
12. While much work is being done to reduce risk and build resiliency, a lot more remains to be done, especially for communities in arid and semi-arid regions.
13. Moreover, the urban context, especially the urban poor, is currently not adequately addressed in terms of data (especially intra-urban disparities) and risk assessments. Urban risk assessments are a useful approach for identifying measures to assess a city's risk level and can play a significant role in reducing and managing the potential for disasters.

Using science and technology to reduce disaster impact and to build resilience

14. The human and economic cost of hazards and disasters in the Horn of Africa can be lessened by the innovative use of technology. The ultimate goal of using science and technology is to move from constantly responding to disasters to building resilience – that is managing risk rather than crises. This requires sound understanding of the risks, effective monitoring and early warning systems and building resilience through mitigation and adaptation strategies. This means factoring DRR in wider development planning for which science and technology make it possible to have a credible evidence base.
15. Geospatial technologies including Remote Sensing (RS) techniques, Geographic Information Systems (GIS), as well as climate model-based prediction, early warning systems and risk assessment tools can be used to monitor situations before, during and after disasters. They have applications in short and longer term planning, can guide mitigation and adaptation strategies as well as inform investment decisions.
16. Advanced technologies for mapping underground water resources can transform regions and communities that have been marginal for centuries, as well as the wider countries they are located in. Recent examples include the finding of vast aquifers in the Turkana region of northern Kenya. Such finds need further investigation regarding

quality and extraction as well as informed planning on their sustainable exploitation. Governance issues such as cross-border aquifers have to be addressed by both policy makers and politicians.

17. Regional and national institutions are providing a range of information and products including early warning on drought as well as flood potential and mapping of other hazards. For instance, remote sensing is being used for information on temperature, soils and vegetation and has the advantage that it can be used to map very large areas. The information thus generated has many applications, many of them related to food security.
18. The Regional Centre for Mapping of Resources for Development (RCMRD) undertakes mapping of a wide range of resources: Remote sensing is used to monitor temperature, soils and vegetation and produce land degradation index maps. Resource mapping also helps identify unexploited resources. One example is the identification of gum Arabic in Karamoja, Uganda, where the gum Arabic provides an alternative source of livelihood and increases resilience of the population. Both RCMRD and IGAD also map hazards including droughts, floods, and forest/bush fires. Meanwhile, mapping of the movement of pastoralists and their livestock helps in assessment of risk of stress on land as well as potential spread of livestock diseases.
19. An example of innovative use of technology for water management that was shared at the conference is the ReseEAU Chad project of the United Nations Institute for Training and Research (UNITAR) Operational Satellite Applications Programme (UNOSAT). The project aims to strengthen national capacity in water resources discovery, mapping and management. The project uses radar and optical satellite technology, accompanied by ground verification to map underground water reserves so as to end up with a comprehensive map of Chad's water resources by 2020. The Water Information System (SIRE) will promote improved knowledge of water resources and contribute to efficient water management, including the involvement of communities. Part of the project will transfer the knowledge and techniques to national experts and also help the local University to develop related curricula. There are also several activities for improving communication around water. A multi-sector approach is adapted and the Ministries of Water (urban & rural), Higher Education, Planning, International Cooperation, Mining & Geology, Agriculture & Irrigation and Regional Development are involved.
20. Also presented at the conference were case studies from Asia. In Vietnam, a very practical application of scientific information is a programme applying climate information in agricultural production. By giving farmers reliable climate forecasts- for one month, 3-6 months, and 12 months-farmers are able to make decisions on matters like planting time, what crops, what fertilizers and when to water and use fertilizer. By selecting optimal planting time, there is vast improvement in harvest as well reduced watering and use of pumps. The Agro-Climate Bulletin is well received by farmers. This is partly due to the reliability of the information provided over the years as well as the project's work with NGOs and local governments in order to understand local customs, as well as training of agricultural extension officers who help to translate the climate information into farming decisions that need to be taken.
21. In 2011, the city of Bangkok, Thailand experienced severe flooding, resulting from rains that were 35% higher than the average. Satellite mapping and flood modelling was extensively used to monitor the flooding as well as guide the response effort. Lessons learned from 2011 have led to institutionalisation of flood modelling in mitigation planning as well as an improved flood forecasting and warning system that includes better communication with governance structures and communities. Similarly, the work of the Asia Disaster Preparedness Centre (ADPC) has led to mainstreaming of risk assessment in several development sectors. In Myanmar and Bangladesh risk information is integrated in urban land use planning, while in Lao PDR landslide risk

assessments are used by the roads sector. These Asian examples point to the benefits of multi-hazard, multi-sectoral and multi-discipline collaboration.

22. The Horn of Africa region could use similar applications of risk assessment in different sectors. The Greater Horn of Africa Climate Outlook Forums (GHACOFs) can also make use of emerging dynamical meteorological forecasting systems that offer significantly more advanced seasonal climate predictions, to strengthen early warning systems.
23. Despite the existing initiatives and the availability of information, there are still many examples of missed opportunity, and disasters that could have been avoided, mitigated or better managed even when adequate early warning systems have existed. For example, the 2010-11 drought in the Horn of Africa is an often-cited case in point. One action area for the near future is finding ways to ensure that such information is acted upon as soon as it is received, rather than being reactive, but also to mainstream DRR in all relevant sectors of development planning rather than leaving it largely to humanitarian actors to intervene once disaster strikes.
24. A related challenge is the availability of resources for timely response. The IGAD Disaster Response Fund may need to be enhanced, and individual countries need to also ensure such funds reach the county level, as well as functioning response systems.

Building capacity for Disaster Risk Reduction (DRR)

25. The multiple challenges facing the IGAD region require useful and useable data and comparable methodologies for risk assessment to inform development policy and practice. Convincing end users to make science-based decision requires accurate data and analysis.
26. End users need information to act, and are in most cases looking for knowledge derived from data and analysis, rather than raw datasets. The first requirement is availability of adequate and reliable data covering relevant development sectors and regions. However, across the IGAD region, there are significant disparities between countries on availability, accuracy and currency of data, as well as human and technological capacity for collecting, verifying, storing, collating and analysing, as well as applying.
27. Linking data/information to the end user requires effective knowledge management and good dissemination strategies. There is need to respond to demand but also to create a demand for DRR information and data. This requires capacity to offer targeted products together with appropriate dissemination strategies. Capacity development is a vital strategy for the DRR agenda.
28. Many capacity building institutions and programmes exist within and outside the IGAD secretariat. Capacity development has covered a wide range of areas including development of geo-spatial tools with partners, training and technology transfer for end users. The Regional Centre for Mapping of Resources for Development (RCMRD) alone has trained more than 500 practitioners in applications covering a diversity of development sectors. Similarly IGAD's Climate Prediction and Application Centre (ICPAC) has conducted technical training on Systems Administration, GIS and RS, and targeted Thematic Services.
29. Additionally, UNOSAT has already delivered several technical trainings to IGAD, based on prior needs assessment. Post-training assessment has indicated a significant increase in skills and knowledge and an appreciation of the training by IGAD staff. UNOSAT continues to support such capacity building efforts in the region.
30. Despite these and other capacity building efforts, there is a perception that the results are not very obvious. There are still gaps in capacity and the training does not have

significant demonstrated results/outcomes. While the importance of capacity is widely recognised, how it emerges, how to develop and evaluate it and how to sustain it, is less obvious. Some questions have been asked:

31. Was the training based on identified need?
32. Are the right people being trained?
33. What impact is the training having? How can it be measured?
34. A related concern is post-training follow up and 'backstopping' to ensure that trainees are able to apply their training hands-on. This may involve not just the trainee's capacity but the environment in which they return to practice and may require support to the institution including infrastructural and thematic services.
35. There is need to engage more with national institutions of higher learning on curriculum development to provide more people with the academic foundation for the training needed for DRR related work, and also to generate research that can feed into capacity-building. Such partnerships can be with regional as well as external universities.
36. One challenge is that institutions do not always manage to retain trained people. This is a key issue that negatively impacts on the ability to have a critical mass of trained personnel in relevant institutions, and for which there are no easy answers.
37. Data is expensive and open source data is often used. Two challenges to this are: the quality of such data; and the mandate and capacity of the moderator. It is also possible that open data may increasingly become commercialised – hence more need to fortify budgets.
38. Moreover, there is quite a lot of duplication of effort in the region. More collaboration and division of work could lead to more efficient use of scarce financial resources.
39. Micro-level data is difficult to access, for example, community data including urban data on intra-city differences. This is one area where indigenous knowledge and engagement with communities can be beneficial but it also calls for capacity to use such knowledge and to effectively link it with more formal knowledge. A good example of community-generated data is the Rwandan Red Cross which undertakes mapping with communities.

Engaging the end user

40. Engaging end users of information helps ensure use of the information, better targeting and therefore more efficient use of resources that go into production of information products. Potential users in this case include political leaders, policy makers and development practitioners, the private sector and the general public, including communities at risk.
41. There is need to understand the demand for information for better targeting and packaging. This has been done through needs assessments as well as monitoring how information has been used including feedback from users.
42. There is also a case for creating a demand for information which may require dissemination and marketing strategies and in some case building the capacity of the end user on using the information.
43. Involving the end user in the production of the information – according to the user's different capacities, promotes ownership of the information and greater likelihood of use of the information. This is true of communities as much as institutions.
44. It has been noted that often governments have not acted (or acted on time) on information provided on disaster risk. Use of the public media (print, broadcast, etc.) has been used to lessen such instances. In this case the media are themselves not

only end users of the information, but also relevant for diffusing it to other layers of end users. The region has a growing network of journalists that are knowledgeable on climate and risk issues and write stories to inform the public, stimulate debate and provoke government to action. The media has also played a role in investigating governance issues that contribute to the severity of, or the inability to, respond to extreme events.

45. Challenges for the media include lack of access to appropriate training to cover risk related issues, as well as financial resources to mainstream DRR in media work – beyond reporting disasters and emergencies.
46. The private sector needs to be more engaged as a potential end user. There are obvious uses of DRR information for the private sector. If convinced, there is potential to buy information or to partner in developing specific applications/products. UNOSAT and AnsuR have recently collaborated on an application for IGAD. This IGAD-ASIGN application is made available to facilitate citizen contributions towards DRR and IGAD's work in this domain. Photos provided by contributors are used by IGAD to document local risks and DRR work. Photos can also be used as field validation of IGAD, UNOSAT, RCMRD and other partners' satellite image analyses, thus contributing to accurate and efficient DRR solutions. Images provided will help vulnerable countries in the region to make better and faster decisions for DRR.

Ensuring synergy and building regional collaboration: emerging issues and opportunities for future action

47. No less than thirty five (35) DRR initiatives were identified in the region including some that work at the national level only, with varying levels of collaboration among them. There is overwhelming consensus that much more collaboration and coordination needs to be done. Collaboration across the globe is important but it is also vital to build regional capacity in order to ensure a critical mass of regional competence to provide regional solutions.
48. Lack of coordination and collaboration can result in contradictory information and messages as well as overlapping mandates. The consequences of this are many and include less than optimal use of resources as well the danger of loss of credibility, and the confidence of end users.
49. There are many cross border issues, some of which have huge potential to cause conflict. There is therefore a need for policy development and harmonisation, for which data/information is critical. Further, there is increased demand for evidence-based planning and programming. DRR initiatives in the region can capitalise on this.
50. Other issues that need to be considered in order to ensure greater synergy in the Horn of Africa DRR activities include:
 - Different DRR initiatives need to be tied to IGAD's global policy on sustainable development;
 - Resource mobilisation is a challenge that will benefit from more collaboration/coordination. It may be worth considering a mutually supportive mobilisation strategy and to agree on what institutions have global mandates and what sub-specialisations are assigned to the others as areas of more specific focus;
 - Areas that can benefit from a common approach include programming, standards and guidelines as well as fund raising;
 - Sharing and publicising regional best practices is important. Documentation is needed of best practices on data collection, management and use; on how science has made a real difference in DRR as well as on communicating scientific information to non-scientists or non-technical personnel. Such success

stories will be of learning value for DRR networks, and may also help in creating a demand among potential end users of DRR-related data, products and information;

- In order to succeed in DRR work as a region, special measures must be taken to address the huge disparities in country level capacities to collect, manage and use data. Affirmative action for South Sudan may be called for;
- Overall risk assessment needs to be scaled up – this could be an area that can be reinforced in IGAD where efforts to mainstream DRR in all sectors are ongoing;
- More attention also needs to be paid to land management and use as a DRR issue;
- There is a need to deepen engagement with the public media- print and electronic- and to promote more regional media linkages as well as use of social media tools;
- The Post-2015 Hyogo Framework for Action process provides a good opportunity for collaboration

Conclusion

Innovative use of science and technology is already playing a critical role in improving DRR in the Horn of Africa. More can be done through increased dialogue, synergy and collaboration of all actors in their use of science in development and risk reduction planning and programmes. Furthermore, greater understanding and an acceptance of science is needed by policy makers, as well as scientists promoting the benefits of science clearly to the end users. As one participant said at the end: “I need to celebrate my science, better still when I can use it to solve a real problem.”

Wandia Seaforth
Wilton Park | February 2014

Wilton Park reports are brief summaries of the main points and conclusions of a conference. The reports reflect rapporteurs’ personal interpretations of the proceedings – as such they do not constitute any institutional policy of Wilton Park nor do they necessarily represent the views of the rapporteur.

Should you wish to read other Wilton Park reports, or participate in upcoming Wilton Park conferences, please consult our website www.wiltonpark.org.uk

To receive our e-newsletter and latest updates on conferences subscribe to <https://www.wiltonpark.org.uk/newsletter/>

ANNEX

DDR initiatives in the region

This list was compiled during the conference, and represents those DRR initiatives known to participants.

- IGAD Drought Disaster Resilience and Sustainability Initiative (IDDRSI)
- IGAD Disaster Response Fund
- Resilience Analysis Unit (RAU) for IGAD region by IGAD, FAO, WFP, UNICEF
- Climate Warning Initiative – UNEP
- IGAD Disaster Atlas /Hazard Mapping – IGAD
- MESA IGAD Thematic Area (AU, IGAD, ICPAC, RCMRD, MS)
- Vulnerability Mapping in South Sudan (NPA)
- UNESCO Groundwater Resources Investigation for Drought Mitigation in Africa Programme (GRIDMAP)
- CEWARN Rapid Response Fund
- World Bank Supported DRR Initiative – ICPAC
- UNDP DRR work
- UNOSAT Capacity Building for DRR Project
- USAID Planning for Resilience in East Africa through Policy, Adaptation, Research and Economic Development (PREPARED) Programme
- IGAD Inland Water Resources Management Programme (INWRMP) / HYCOS
- ACMAD – Famine Early Warning Systems Network (FEWSNET)
- SERVIR Africa
- Interagency Group on DRR (NGOs)
 - CARE
 - OXFAM
 - World Vision
 - European Provision of Regional Impacts Assessments on Seasonal and Decadal Timescales (EUPORIAS)
 - DFID Strengthening Adaptation and Resilience to Climate Change in Kenya (STARK) PLUS
 - Adaptation Learning Programme (ALP)
 - Hunger Safety Programme
 - Africa Climate Change Resilience Alliance (ACCRA)
- Integrated Water Management Programme (IWMP)
- Institutional Support to African Climate Institutions Project (ISACIP)
- Building Resilience and Adaptation to Climate Extremes and Disasters Programme (BRACED) – DFID
- KenMet
- WHO Regional Programme on DRR
- WMO – Severe Weather Forecasting Demonstration Project (SWFDP) for Met Service
- WMO/IWA programme on drought
- WMO Global Framework for Climate Services (GFCS)
- World Bank – Regional Pastoral Livelihood Resilience Project (RPLRP)
- Rwanda Red Cross Community Mapping
- Regional Centre for Mapping of Resources for Development (RCMRD)
- Food and Agriculture Organization of the UN (FAO)
- UNEP – Africa Environment Outlook (AEO)
- KFW Bankengruppe
- World Bank/GFDRR- Horn of Africa portal
- PreventionWeb
- Global Risk Data Platform